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## A LAPLAND LONGSPUR TRAGEDY:

BEING AN ACCOUNT OF A GREAT DESTRUCTION OF THESE BIRDS DURING A STORM IN SOUTHWESTERN MINNESOTA AND NORTHWESTERN IOWA IN MARCH, 1904.<sup>1</sup>

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### Plates XIII and XIV.

A CONSIDERABLE amount of interesting and highly valuable information in regard to the always mysterious migratory movements of birds has been obtained of late years by studying the destructive effects of great or unseasonable elemental disturbances; such disturbances operating either alone or, more frequently, in conjunction with various artificial obstructions of human devising. Lighthouses, prominent electric lights in cities and villages, brilliantly illuminated buildings and similar lures, together with the net-work of wires, that now form a huge cobweb over such a large portion of the surface of the globe, serve, especially in times of unusual darkness and storm, to lead to their death countless thousands of the hurrying, migrating hosts. The light of morning permits an inventory of the dead and dying that reveals, not infrequently, facts that are new in regard to the movement, distribution and comparative abundance of little known species and much in regard to many others that may be surprising and that could have been learned in scarcely any other way.

It is my purpose in this article to present to the Union an account of one of these great bird catastrophies that, by reason of its extent

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<sup>1</sup> Read at the Twenty-third Congress of the A. O. U., New York, Nov. 16, 1905.

and some of the questions involved, may prove interesting even if it be possessed of no very great intrinsic value.

About the middle of March, 1904, there appeared in the daily papers of several Minnesota cities and villages brief telegraphic statements of the destruction of large numbers of a small brown bird during the night of March 13-14 in and about the villages of Worthington and Slayton in southwestern Minnesota, well out in the prairie portion of the State. A day or two later several of the dead birds were sent by a physician of Slayton to the State University at Minneapolis, and were referred to the writer for identification. They proved to be Lapland Longspurs (*Calcarius lapponicus*). Nearly a week had now elapsed, but as it was learned by telephoning to one of the towns in question that the accounts were not unfounded or exaggerated and that abundant evidence of the bird destruction still remained, Dr. L. O. Dart was sent as a representative of the State Natural History Survey to gather all possible data bearing upon the event, and it is from the information secured by him that this account is prepared.

Dr. Dart went first to Worthington and Slayton, the two places where the birds were killed in greatest numbers, and there made careful personal examination into the then existing conditions by studying the numbers and distribution of the dead birds and the post mortem findings; and also had a series of interviews with various residents who had been eye-witnesses of the event. A less thorough examination was made at several other places. A few days later letters of inquiry were addressed to the postmasters at some twenty-three villages in southwestern Minnesota, northwestern Iowa and southeastern South Dakota in an attempt to secure further information that might give some definite idea of the extent of the area of destruction. Ten replies were received to these letters. Most of the citizens in the towns where the birds were killed had been so impressed by the extent and unusual character of the phenomenon that they were ready and indeed eager to give their experiences and to get any expression of opinion as to the causes of what was locally called "the great bird shower."

Beginning his observations at Worthington, the county seat of Noble County, on March 22, eight days after the Longspurs were destroyed, Dr. Dart found large numbers of dead birds in all the

streets of the village, but it was said that many had been washed away by a hard rain storm which occurred on the night of the 20th. All over the courthouse yard dead birds lay only five or six feet apart, and this was reported to have been the condition throughout the town the morning after the storm. Adjoining the town on the west and the east lie two small lakes, each having an area, at a very conservative estimate, of one square mile. The winter ice was still on these lakes but the snow had melted and frozen again, thus presenting an unobstructed hard surface. Here the dead birds were more conspicuous than among the grass and mud of the fields and town, and the ice was found to be everywhere dotted with their bodies over the entire surface of both lakes. Dr. Dart walked out to the middle of each lake and made careful estimates by measuring off a number of twenty-foot-square areas in various places and counting the birds in each. The average showed five and a half birds to the four hundred square feet, or a total of 374,328 birds on each lake, which reveals the remarkable fact that in round figures there were 750,000 Lapland Longspurs on the surface of these two lakes alone! And this figure, large as it may seem, is really less than the truth, for the estimate, in order to keep well within bounds, has been cut in one or two places, and a million birds, incredible though it may seem, is probably nearer the truth.

In clumps of bushes around one of these lakes were many live Longspurs, showing evidences of various injuries more or less severe. Some could not fly sufficiently to avoid being taken in the hand. They had evidently managed since the storm to eke out an existence in these sheltered places, unnatural haunts though they were for Lapland Longspurs. At a residence in town were seen two live Longspurs, a male and female, among the plants in a window garden where they had been fed and lived contentedly since their capture on the 14th. They were not at all shy. Dr. Dart states in his notes that from his observations about town he could not determine positively that there were, or had been, more dead birds under the wires than elsewhere.

The interviews had at Worthington resulted as follows: The village night-watchman said that on the night of the 13th-14th there was practically no wind and that snow was falling steadily and quietly during a portion of the night. He first noticed the

birds about 11 p. m. and from that hour they were abundant until morning. They were most numerous in the vicinity of the electric street lamps but he remarked, "they seemed to be everywhere." He saw many fly against buildings and picked them up dead and heard others strike and fall in the darkness. He said the ground in places was covered with dead, wounded and apparently unhurt birds. A great many were buried in the snow with just their heads out and some of them when picked up, warmed, and dried, would fly away as well as ever so far as he could see. These birds appeared to him more bewildered than hurt.

The night telegraph operator stated that he counted sixty-one dead birds in going one and one-half blocks and saw fully one hundred live ones. He caught seven or eight of the latter, carried them home, warmed and dried them and when released next day, they flew off all right, except one bird which was injured. The night was not cold. The snow was in large flakes, quite wet, and fell quietly to the depth of five or six inches. The birds began to arrive about 11 p. m. and continued until three or four in the morning.

Another observer who was out at midnight said that the air was everywhere full of birds but that they were more numerous about the electric lights than elsewhere. He saw some inside of the arc-light globes. Many were captured and examined. Some were injured but others were not. These latter would lie in the snow and make no effort to escape. The feathers of many were soaked from the wet snow. The walks and streets were covered with dead and live birds.

An electrician in the employ of the electric light company reported that on the night in question there was a scarcely perceptible wind from a little east of south. The temperature was above freezing. The birds appeared about 11 p. m. and kept coming until nearly daylight. He corroborated what the others had said but thought that the next morning the dead birds were most numerous under the electric lights and net work of wires in the central portion of the village. The ground in such places was literally covered with them. He took five or six out of one electric light globe. He caught ten or twelve and took them home. They were not timid and ate ravenously out of the hand. All flew away when liberated later.



Dead Lapland Longspurs lying where they fell among the grass in the Court House Square, Worthington, Minn., during a storm, March 13-14, 1904.



Lapland Longspurs killed during a storm at Worthington, Minn.,  
March 13-14, 1904.



A Mr. Drobeck reported that on the morning following the storm he noticed lumps or balls of snow on the roof of his barn and that when they thawed in the morning sun, they were found to contain live birds. The heads of the birds would first appear, and then, shaking off the snow, they would sit for a time in the sun drying and preening themselves and then fly off. He caught several and took them in the house and it was two of these birds that Dr. Dart saw in his window garden a week later. This curious statement was corroborated by a second observer. Evidently the birds had become wet and snow-laden, and falling into the sticky snow had by their efforts rolled themselves into snow-balls.

Dr. Manson and Dr. Humiston, two physicians of Worthington, gave their testimony along the same lines as above. The former added that he noticed that many of the birds had entered the snow head foremost as though they had pitched down head-long rather than as though they had fluttered down as they probably would have done after striking some obstacle. When these birds were picked out of the snow it was found that the snow was stained with blood that had oozed from their mouths.

Slayton, the county seat of Murray County, situated about twenty-five miles north and six miles west of Worthington, was the next place investigated. It was stated by several residents of this village that on March 13, after a rainy and windy afternoon, the wind fell toward night to a gentle breeze from the southeast, and later a heavy wet snow began falling which continued for several hours, but the snow accumulated to a depth of only an inch or two. The temperature was above freezing. There were no electric lights here, the streets being lighted with gas. There were also fewer wires. On the 23d of March, nine days after the storm, Dr. Dart states that dead birds were in evidence everywhere in town. Heads, wings and tails could be seen sticking out of the mud everywhere in the main street and in other streets even to the outskirts of the town. It was stated that on the morning of the 14th twenty-nine dead birds were swept off the seventy-five feet of sidewalk in front of the hotel. From the roof of the latter building Dr. Dart counted nineteen dead Longspurs in the eaves-trough, and undoubtedly many had been washed away by the heavy rain on the 20th. Scattered over the roof of an adjoining building

were a number of dead birds, and others lay in the eaves-trough of still another building.

It was stated that nearly every family in the town had captured from two or three to a dozen or more live birds and that after they had been cared for for a short time they flew off as well as ever. Thirty-six hours after the storm twenty-one live birds were counted harboring in one of the lumber yards. A German farmer living a half mile northwest of the town saw six birds at his place on the morning of the 14th; four were dead and two alive. The latter he caught, took them in the house and later they flew away.

In view of his experience at Worthington, Dr. Dart made an examination of the ice on a small lake a half mile or so from Slayton, but found no dead birds there.

Dr. Davis of Slayton reported that the day following the storm he drove forty miles east of the town and did not see any dead birds outside of the village. He, however, saw flock after flock of Longspurs, and thinks that he never before saw so many of these birds at this time of the year. On the morning of the 14th he picked up fifty dead birds in a space twenty-five by fifty feet behind a store. He thought the greatest destruction was in the central part of the town.

Dr. Lowe, however, said that dead and live birds were all over town and that his children picked up sixty-one in his door yard and that many still remained. He counted twenty-one on the ground under one lamp-post. Dr. Lowe and the editor of the local paper reported that there were many birds perched on the window sills all over town early in the morning after the storm.

The Slayton town marshal said that on the afternoon of the 13th he saw large flocks of small birds on a hill north of town. He first noticed the birds at night a little after nine o'clock. The birds seemed to come from the east and were circling over the town and twittering as though confused and lost. Between nine and ten, he saw many strike windows and fall dead or stunned. After 10 P. M. there were only three street lights burning and around these lamps the dead birds were most numerous. On the following morning most of the dead birds were under the snow. Three or four days after the occurrence many of the birds were still flying about the town.

At Avoca, a little town seven miles southeast of Slayton, Dr. Dart saw dead Longspurs in the streets and on the ice of a small lake near by.

W. J. Ross, station agent at Heron Lake, twenty-five miles southeast of Slayton, reported that many birds were killed there in the same storm — all Longspurs.

Information gleaned by personal interview with a man who had been an eye-witness showed that large numbers of Longspurs had been killed on the night in question at Luverne, the county seat of Rock County, and distant thirty miles due west from Worthington. Also that dead birds were to be seen at all points along the railroad between the two places.

A communication from the postmaster at Sibley, the county seat of Osceola County in northern Iowa, fifteen miles southwest of Worthington, stated that many birds were killed there on the night of the 13th-14th during a snow storm. On the morning of the 14th he saw from seventy-five to one hundred dead birds as he walked three blocks to the post-office. There were also many live birds unable to fly, some of which stayed about several days. There are no electric lights in Sibley.

C. A. Kinsey reported by letter from Adrian, a town eighteen miles west of Worthington, that the birds appeared there in the early half of the night, and while he did not think that they were killed in large numbers, many were on the ground through the night and the following morning, unable to fly.

Reports received from a number of other localities, including letters from John Crawford of Lakefield, John Knox of Jackson, and A. D. Brown of Pipestone, showed, by the negative evidence they furnished, the outside limits of the Longspur flight. In this way it is possible to define fairly well the region within which the destruction took place and it would appear that this area embraced at least fifteen hundred (1500) square miles. There are about forty towns and villages within this region, but many of them are small and probably did not figure largely as centers of bird destruction.

A brief statement may be offered in regard to the post mortem findings of the dead birds. The bodies of many birds were carefully examined at all points where observations were made and the

findings were uniform. Briefly, all died from injuries of various kinds. Besides some one hundred and fifty birds examined carefully in the field, one hundred were picked up on the ice at Worthington and about the village and as a matter of curiosity were brought home, dissected and detailed autopsy notes made of each. A general summary of these notes show that in many the skulls had been fractured and indented, leading to cerebral hemorrhages; while in many more the bones of the body had been variously crushed, accompanied by extensive internal hemorrhages. In some instances the impact had been forcible enough to rupture the intestines, lungs or other viscera. A few had their necks broken. Many had broken wings and legs associated with other more fatal injuries. The birds picked up on the ice had just as extensive injuries as those found elsewhere, and it seemed certain that in their utter confusion they must have dashed headlong onto the surface of the lake from a considerable height. All the birds were very fat and had been in excellent condition. Examination of the stomachs of many dead birds revealed the fact that all were empty except for small amounts of fine gravel; even this was wanting in some instances.

It would be futile to attempt any calculation as to the probable number of birds killed during that one night. The center of destruction seems to have been at Worthington, where, taking the reasonably accurate basis of calculation furnished by the lake surfaces as a guide, it would seem that certainly not far short of a million and a half birds were killed. Not as many were killed at other points, so far as known, but what the grand total for the whole area of fifteen hundred (1500) square miles must have been I will leave for your imagination to picture. All of the birds were Lapland Longspurs. Not an individual of any other species was found.

As to the explanation of this catastrophe: It is plain enough that on the fateful night there was in progress an immense migratory movement of Lapland Longspurs leaving the prairies of Iowa where they had passed the winter months for their summer homes in the Northland, and that becoming confused in the storm-area by the darkness and heavy falling snow they were attracted by the lights of the towns and congregated in great numbers over and about these places. In their bewildered condition great numbers flew

against various obstacles and were killed or stunned while many others sank to the ground exhausted. It would also seem probable that a considerable number became wet and snow-laden by reason of the character of the snow, and thus, unable to fly, were forced downward to the earth to be dashed to death if falling from a considerable height, or simply stunned if from a lower elevation. This theory that the birds fell heavily or darted swiftly downward from high in the air would seem to be the only way to explain the presence and the extensively mutilated condition of the dead birds on the ice of the lakes at Worthington and elsewhere. Many of the dead birds found in the yards and fields and on the roofs of buildings appear to have met death in the same manner.

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#### OBSERVATIONS ON SOME BIRDS PROCURED NEAR CHARLESTON, SOUTH CAROLINA.

BY ARTHUR T. WAYNE.

**Colymbus auritus.** HORNERD GREBE.—This Grebe is exceedingly abundant from November until the middle of March, but it is rare to obtain one in full adult nuptial plumage while the birds sojourn here, as they commence to migrate long before the breeding plumage is acquired. The change from winter to summer plumage begins about the 10th of March. A specimen taken April 7, 1888, was assuming the characteristic nuptial plumage, while a bird shot on March 21, 1906, has the throat mottled with black and the fore neck pale chestnut.

Dr. Eugene Edmund Murphy took a specimen in almost perfect nuptial plumage at Cape Romain on May 15, 1904, and the writer procured a male near Mount Pleasant, on June 5, 1907, which very closely resembles the bird taken by Dr. Murphy. Both of these birds were in good condition, and not wounded, hence it is remarkable that they should have remained on this coast so late in the season of reproduction.

**Nyctanassa violacea.** YELLOW-CROWNED NIGHT HERON.—On March 23, 1907, the writer shot a female of this handsome

species, and upon examination found the abdomen bare and the skin wrinkled showing that incubation was going on even at this early date. Upon dissecting the specimen it was found that two eggs had been laid, while the third, which would have been the last, was almost ready for extrusion. As far as my information on the breeding of this species goes this is the earliest record for the South Atlantic States, with the possible exception of the southern part of Florida. It must be borne in mind, however, that the winter of 1907 was exceptionally mild, and July and August temperatures prevailed during the latter half of March. The day on which this heron was shot the thermometer registered 94.2 degrees.

**Helminthophila bachmanii.** BACHMAN'S WARBLER.—During the month of March, 1907, I kept a sharp lookout in suitable localities near my home for the arrival of this rare warbler, but although I was in the woods almost daily no birds were observed until the breeding ground was visited, when six pairs were located in various parts of the swamp where the first nests and eggs were taken in April, 1906 (see Auk, XXIV, Jan., 1907, pp. 43-48). Some of the birds must have certainly arrived not later than February 28 or March 2, as the first nest, found on March 27, contained one egg. This nest was left until the 30th, when it contained four fresh eggs and the female was incubating.

On April 3 I found a nest which contained five eggs far advanced in incubation. This nest and eggs was found within fifty feet of the spot where the first nest was taken on April 17, 1906, and doubtless belonged to the same pair. This nest was evidently commenced on March 9, and as it requires fourteen days for the completion, and five days in which to deposit five eggs, it will be seen that on March 27 or 28 incubation must have just begun, as the eggs were undoubtedly incubated for at least eight or nine days. These nesting dates are important, and prove that although this species does not winter it is one of the earliest migrants in the spring and breeds even earlier than the resident Yellow-throated (*Dendroica dominica*) and Pine Warblers (*Dendroica vigorsii*). It also proves that the birds which breed in South Carolina reach their summer home much earlier than those which migrate along the Gulf coast States and breed in the Mississippi Valley, for the Bachman's Warblers that breed in the low coast region of this State undoubtedly migrate along the Atlantic coast.

1907

At Branford on the Suwannee River, Florida, the writer first met and secured this warbler on March 14, 1892, while migrating birds were noted until April 2. The next year I was collecting at Old Town, sixty miles down the Suwannee (from Branford), and took the first Bachman's Warbler on March 10, the birds being noted until the 22d of the month, when all had apparently gone north.

In 1894 I obtained the first specimen on March 13 at the headwaters of the Wacissa River, Jefferson County, Florida. Although I recorded this bird as a migrant (Auk, Vol. XII, October, 1895, p. 367) I now believe that it breeds locally and sparingly near the village of Waukeenah.

On March 30, 1907, I shot a fine male of this warbler near Mount Pleasant from near the top of a huge water-oak tree some eighty feet above the ground. It was singing exactly like a Prothonotary Warbler (*Protonotaria citrea*), and when I went to locate the singer I was surprised to see that it was not that warbler, but one with a black throat and breast patch. The bird sang constantly, and as the song was identical with that of the Prothonotary I concluded that it must have been either the Golden-winged (*Helminthophila chrysoptera*) or Lawrence's Warbler (*H. lawrencei*) — forms I have not seen in life — and determined to secure it, which I did, after having heard it sing for more than twenty minutes. Upon securing the specimen I was amazed to find that it was in reality a Bachman's Warbler. This song must be very rare or else produced by a bachelor male.

***Helminthophila celata orestera.*** ROCKY MOUNTAIN ORANGE-CROWNED WARBLER.—On December 6, 1893, I shot a very large and richly colored specimen (♂ ad.) of what I supposed was the Lutescent Warbler (*Helminthophila celata lutescens*). I sent this bird to my friend Mr. William Brewster for determination, and under date of January 25, 1894, he wrote concerning the specimen as follows: "The Orange-crowned Warbler is *not lutescens*. It is not nearly yellow enough but matches closely the birds which occur in Texas and the Mississippi Valley generally."

In 'The Auk,' XXII, July, 1905, pp. 243-245, Mr. Harry C. Oberholser described under the name *Vermivora celata orestera* a new form of the Orange-crowned Warbler from the mountains

of New Mexico. Having the specimen in mind that I sent to Mr. Brewster in January, 1894, I wrote him in August, 1905, for the loan of it. He very kindly forwarded the specimen, together with a large series of specimens of the form *celata* from Colorado Springs, Colorado, that he personally collected. Upon comparing the South Carolina bird with Mr. Brewster's series from Colorado I found that the former was even more richly colored than any of the latter and was an ultra typical example of Mr. Oberholser's new race, *orestera*. This discovery led me to examine my South Carolina specimens of Orange-crowned Warblers, that I had packed away for many years, and the result was I found no less than three birds clearly referable to *orestera*, as follows: January 2, 1890, male; February 11, 1891, male; December 3, 1896, male, all of which were taken near Mount Pleasant.

The bird taken December 3, 1896, is an ultra typical example of *orestera* while the others are nearer that form than *celata*.

This new race is supposed to be a Rocky Mountain breeder, and Prof. W. W. Cooke<sup>1</sup> is of the opinion that no bird (which breeds in these mountains) migrates to the Atlantic Coast unless it breeds in the Mackenzie River region.

If this form is entitled to recognition another far western bird is added to the fauna of South Carolina.

**Dendroica tigrina.** CAPE MAY WARBLER.—This beautiful species is a regular although rare autumnal migrant along the coast, but I have not as yet detected it in the spring. Up to 1905 my latest autumnal record was October 18, and the earliest September 8. On October 31, 1906, I shot a young male in my yard, which was feeding among some lavender bushes, and on November 3 I secured a young female at the same spot where the male was obtained.

All the early migrating Cape Mays have been adult birds, whereas the latest migrants are invariably the young of the year, which is indeed very strange. At Chester, Mr. Leverett M. Loomis noted this warbler from October 4 to 26 (Auk, VIII, April, 1891, p. 170). It will be seen that the birds arrive near Charleston nearly a month earlier than at Chester.

**Dendroica striata.** BLACK-POLL WARBLER.—The Black-poll

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<sup>1</sup> W. W. Cooke, in epist.

Warbler is abundant during both migrations, but more abundant in the autumn than in spring. On November 14, 1906, I procured a female in my yard. The day upon which the bird was shot the thermometer registered 28°. My latest previous record is October 29, 1894, and as far as I am aware the bird taken November 14, 1906, is the latest record for the United States with the exception of one from southern Florida taken or observed on November 16, 1887. (See Distribution and Migration of North American Warblers, Bull. Biol. Survey, No. 18, 1904, by Wells W. Cooke.)

**Sitta canadensis.** RED-BREASTED NUTHATCH.—In 'The Auk,' XIII, 1896, p. 85, the writer recorded two birds of this species from Long Island, taken November 14, 1895. Since these birds were observed I have found the species to be an irregular autumn and early winter visitor, as the following records will show: Long Island, November 27, 1901. Shot six and saw upwards of a hundred in pine and cedar woods; also shot two on December 26 at the same place. Dewees Island, December 18, 1903. Took an adult male. Oakland plantation, Christ Church Parish, October 29, 1906. Shot an adult male, the specimen being the only one I have as yet observed on the mainland. My friend Mr. Herbert Ravenel Sass observed two birds in his garden in Charleston on October 29, 1906. Long Island, November 3, 1906. Saw upwards of twenty-five and obtained two. Dewees Island, November 17, 1906. Shot two males and observed perhaps thirty individuals.

This species shows moult when it arrives, and as long as it remains, which is certainly remarkable. The birds feed upon the seeds of the pine and cedar and seem to be particularly fond of the seeds of the latter tree. While the birds have been common in November, 1901, and November, 1906, they apparently do not remain through the winter months, but disappear almost as suddenly as they arrive. Mr. James P. Garick, Jr., informs me that the birds were very abundant at his home in Weston (a few miles south of Columbia) in the autumn of 1906, and I have a very high plumaged male taken by him on October 10, 1906.

**Polioptila cærulea.** BLUE-GRAY GNATCATCHER.—Although this species is said to winter from "Florida southward" by Mr. Chapman (Birds of Eastern North America, 1895, p. 394) and also by Mr. Ridgway (Birds of North and Middle America, Part III,

1904, p. 718) who says: "wintering in Florida and other Gulf States," these statements are misleading and inaccurate, for the Blue-gray Gnatcatcher winters regularly on the coast of South Carolina. I have long known this fact, for on December 15, 1885, I saw about a dozen birds near Charleston and shot four specimens; while in January, 1886, others were noted during the memorable blizzard, and which was the coldest weather up to February, 1899. I here-with mention a few dates on which others were taken: January 10, 1889, one; January 2, 1893, one; December 26, 1898, saw two and obtained one; February 4, 1903, one. All the specimens taken are apparently *immature* birds and the question is where do the adults winter? As they are presumably more hardy than the young the assumption would be that they, or at least some of them, winter at points along the coast to the northward of Charleston. This is, however, not the case as there are no records of the birds wintering in North Carolina. Why the *young* of this species should winter and not the *adult* is certainly very strange.

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#### ON HYBRIDS BETWEEN THE MALLARD (*ANAS BOSCHAS*) AND CERTAIN OTHER DUCKS.

BY HENRY B. BIGELOW.

THE collection of the Museum of Comparative Zoölogy at Harvard University contains four hybrid ducks which are well worthy of description. In all one parent is Mallard, the other being Black Duck, Pintail and Baldpate respectively. All of these crosses have been previously noted, the Black Duck cross repeatedly, but very few specimens have been described in detail; or with any special reference to the relations of colors to color patterns in parents and hybrid offspring. A complete summary of all descriptions of Hybrid birds published previous to 1906 will be found in Suchetet.<sup>1</sup>

##### 1. MALLARD (*Anas boschas*) $\times$ BLACK DUCK (*Anas obscura*).

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<sup>1</sup> Des Hybrides à l'état sauvage....des Oiseaux, 1897.

Museum of Comparative Zoölogy, No. 42855, ♂, shot on Currituck Sound, N. C., Jan. 9, 1889, by Dr. John Bryant.

The head of this specimen presents a very interesting appearance. The crown, as far back as the occipital region, is dark chocolate brown, the feathers margined and tipped with pale fulvous as in the Black Duck. The sides of the head below the line of the eye are light yellowish brown, striped with dark fulvous and *green*; while the postocular region, comprising a band about .75 in. in breadth running around to the back of the neck, is bright 'Mallard green.' The throat, and lower side of the fore-neck are thickly spotted with fulvous and green, with a few pale spots: a condition seen, though to a lesser degree, in young male Mallards. At the junction of neck and breast the feathers are very pale: this being the only suggestion of the white collar of the Mallard.

The breast, for a band about 4 inches broad, is of the characteristic Mallard chestnut, each feather, however, marked with a semilunar patch of dark brown. Posteriorly the chestnut of the breast shades into a pale yellowish brown, considerably darker than the belly color of the Mallard. At the level of the legs the semilunar spots disappear. Although the general tint of the belly is very much darker than in the Mallard, yet near the sides the characteristic vermiculations of that species can faintly be traced, as they likewise can be on the flanks. The lower tail coverts show a very remarkable condition, the feathers being streaked with black, and with rufous of a tint not occurring on that region in either Mallard or Black Duck.

The middle line of the back is typical *obscura*, the rump, however, is almost black, with a greenish gloss. The scapulars are vermiculated, and the arrow-shaped tertials are of the rich grayish brown of the Mallard. With this parent also the rest of the wing agrees, the speculum having the white frame of that species. The two middle tail coverts are curly, but the general color of the tail closely resembles that of the *obscura* parent. The legs and feet, in the dried skin, are light yellow.

To sum up: undoubted Mallard characters are, (1) green on the head; (2) chestnut breast band; (3) white wing markings; (4) tertials; (5) curly tail coverts; (6) color of legs and feet. Black Duck characters are: (1) color of crown, cheeks and neck; (2)

dark belly; (3) color of median region of back and tail. One character, the reddish markings of the lower tail coverts, appears for the first time in the hybrid.

2. MALLARD (*Anas boschas*)  $\times$  BLACK DUCK (*Anas obscura*).

Museum of Comparative Zoölogy, No. 35638. Greene-Smith coll., No. 631, ♂; Long Island, N. Y. This is a mounted specimen, and has no date.

Crown, from bill over top of the head, dark brown, the feathers edged with yellowish brown. Sides of head and foreneck brownish yellow, or buffy, with dusky spots, exactly as in *obscura*. A well marked postocular stripe on either side is 'Mallard green'; these stripes, however, do not meet at the back of the head; and are somewhat broken by brown feathers. There is a white collar, but it is interrupted both in front and behind. The general ground color of the breast, for a band about 3.6 in. broad, is chestnut, rather darker than in most Mallards. The belly is brownish yellow—considerably darker than in the Mallard parent.

On the breast, as in the foregoing specimen, the feathers are marked with dark brown semilunar patches. More posteriorly these markings become less numerous; and at the level of the legs they disappear. The under tail coverts are streaked with black and rufous exactly as in the specimen already described. Unlike the latter, however, the flanks in the present specimen show no trace of vermiculations. The middle region of the back is typical *obscura*; the rump, however, very dark with a greenish gloss. The wings in general, and particularly speculum, scapulars and tertials, show the characteristic Mallard coloration, while the tail is dusky, as in *obscura*. The three middle coverts are curly. Legs and feet are brownish yellow.

This specimen is strikingly similar to the one already described, showing nearly the same Mallard and Black Duck characters, as well as the same new "hybrid" character.

3. MALLARD (*Anas boschas*)  $\times$  PINTAIL (*Dafila acuta*).

Museum of Comparative Zoölogy, No. 40026, ♂. Shot on Currituck Sound, N. C., Feb. 1904, by Dr. John Bryant.

The bill in this specimen is very interesting. In color it is dark plumbeous, the nail, a stripe along the top of the culmen, and a triangular patch on either side of the mouth being black. This

coloration agrees exactly with the Pintail, but in size the bill suggests the Mallard parent, its measurements (from the dried skin) being culmen, 2.2 in.; depth at base .9 in., breadth .8 in. In adult male Mallards the culmen is about 2.3, in Pintails about 1.8.

The color of the head is a very beautiful combination of that of the two parents. The forehead and crown are dark grayish brown with scattered green feathers. The rest of the head shows a gradation between the Mallard green, and the bronze of the male Pintail. The postocular region is pure green. But the throat, sides of the head and fore neck are emerald in certain lights, and bronze when viewed in others. There is, on each side, a small semilunar white patch below the eye. The white collar also shows an intermediate condition. In front it is about .75 in. broad; but on either side it becomes broader and extends forward along the side of the neck as a narrow V-shaped stripe, about 1.75 in length. It thus approximates the white neck stripes of the Pintail parent. Posteriorly the green of the occipital region gives way to black, which in turn shades into brownish gray on the hind neck and back.

The fore breast is of the characteristic Mallard chestnut, but perhaps rather paler; but this band is only 3.2 in. broad. Posteriorly it shades into a white band, some 3.5 in. broad, which in turn gives way, on the belly, to pale gray marked with fine zig-zag lines. The under tail coverts are velvety black, the feathers elongated and pointed as in the Pintail. The flanks are pale gray, with vermiculations, but posterior to the legs there is a white patch, as in the Pintail.

The back, from neck to rump, is gray, with dark vermiculations as in the Pintail; but most of the feathers are edged with brown, a character evidently derived from the Mallard parent. The rump is very dark, almost black, and the upper tail coverts are black, the feathers edged with pale gray and rufous. This reddish tint occurs in neither parent. The tail has a decided "pin" consisting of two feathers, but these feathers are the two middle coverts, not tail feathers as in the Pintail. These elongated coverts are strongly curved upward. There are, in addition, 16 tail feathers. The scapulars are brownish gray, intermediate in tint between Mallard and Pintail, with the black scapular patch of the Pintail, though this, in the hybrid, is rather smaller than in *D. acuta*.

The tertials are broad arrow-shaped, grayish brown becoming darker at the margin, as in the Mallard. The first two tertials in each wing have the outer half black, thus suggesting the black stripes on the tertials of the Pintail. The speculum is bright metallic green, of a tint quite unlike this region in either parent. Its anterior border is of two colors, the inner half black, as in the Mallard, the outer half chocolate as in the Pintail. The posterior border of the speculum is black; and there is a white frame as in the Mallard parent.

The feet and legs are flesh colored, and agree in size, as well as in color, with the Mallard.

Pure Mallard characters in this very interesting hybrid are: (1) green of the postocular region; (2) chestnut breast band; (3) dark rump; (4) white frame around the speculum; (5) curliness of upper tail coverts; (6) size and color of feet and legs. Pure Pintail characters are: (1) color of the bill; (2) bronze on the head; (3) white neck stripes; (4) white lower breast; (5) presence of a "pin" in the tail, although it is not homologous with pin of *D. acuta*; (6) black scapular patch; (7) number of tail feathers; (8) long neck; (9) chestnut portion of anterior border of scapulars.

Characters appearing in neither parent, but new in the hybrid are: (1) rufous markings of upper tail coverts; (2) green color of speculum.

4. MALLARD (*Anas boschas*)  $\times$  BALDPATE (*Mareca americana*).

Museum of Comparative Zoölogy, No. 42856, ♂. Long Point, Ontario; Nov. 1898. Shot by Mr. Louis Cabot.

The bill is of a dark grayish blue, the nail black, as in the Baldpate. It also resembles this parent in dimensions, measuring along the culmen 1.8 in.; in depth at the base .75 in., and greatest width .72. This is nearly  $\frac{1}{2}$  less than in the case of the adult male Mallard. In outline, also, the bill resembles that of the Baldpate, for it has its greatest breadth about midway of its length. In the Mallard, on the other hand, the greatest breadth is at the base; the bill narrows in the middle, and broadens again somewhat near the tip. The number of strainers forms another Baldpate character, there being in the mandible of the hybrid 38 on a side, in Baldpates 36 to 38, and in Mallards 49 or 50.

The crown from the bill to the occipital region and as far down

on the sides as the eyes, is chocolate brown, the feathers having dark centers which gives a peculiar spotted appearance. This color is somewhat like the crowns of immature Mallard drakes, but does not occur in the Baldpate. The postocular regions on either side are Mallard green; and these stripes join at the back of the head, and extend down the sides of neck for about .5 inch. There is a stripe of Mallard green, mixed with brown and buffy feathers, about .3 in. broad running from the eye down to the throat. The sides of the head, posterior to this stripe and below the postocular patch, are cream-colored with a few black and green feathers, as in the adult male Baldpate. The remainder of the head, throat, and fore neck are pale yellowish brown or buffy, thickly spotted with green feathers. There is no white collar; but the breast is of the characteristic Mallard chestnut, a color totally distinct from the salmon tint of the corresponding region of the Baldpate.

The band is about 3 inches broad and passes posteriorly into white. The belly is white, washed with pale reddish, a character appearing at times in various of the river ducks, and probably due to external causes.

From the anus posteriorly, glossy black, as are the lower tail coverts. The sides are gray, washed with pale reddish, and with darker vermiculations. The flanks are white. Thus the color pattern of the sides and belly agrees with that of the Baldpate parent, while the color of the sides is intermediate between the two species.

The median region of the back is gray as in the Mallard. But the shoulders and scapulars are distinctly tinged with salmon color, a Baldpate character. The rump is very dark, with greenish gloss. The upper tail coverts are light gray, much lighter than in the Mallard, many of the feathers being edged with dirty white. Unfortunately this region is so badly shot that it is impossible to tell whether any of the coverts were curly. The two middle tail feathers are pointed, and longer than the others, as in the Baldpate.

The scapulars are strongly vermiculated; the inner tertials are plain, as in the Mallard, but the outer ones have the outer half black, with a narrow white margin, as in the Baldpate. The speculum is of the purple tint characteristic of the Mallard; with

black frame and white bars as in that species. This pattern is very different from the Baldpate speculum. Immediately anterior to the speculum is a large light gray patch, apparently the remnant of the white patch on the wing of the Baldpate. The legs and feet are yellowish.

To summarize: Pure Mallard characters of this specimen are: (1) green color of the postocular region, the emerald tint being very different from the lighter green on the head of the male Baldpate; (2) chestnut breast; (3) dark rump; (4) speculum and white frame; (5) color of legs and feet. Baldpate characters are: (1) color, size and shape of bill; (2) cream-colored cheeks; (3) white belly; (4) salmon tint on shoulders; (5) black markings on tertials; (6) light patch on the wing. There are no new characters appearing in this hybrid.

Without endeavoring to draw any conclusions from the inheritance of the parental characters — indeed the material is far too scanty — I may call attention to one or two striking results. There are four Mallard characters appearing in all of the hybrids. These are the chestnut breast band, the white frame about the speculum, the dark rump, and the presence of 'Mallard green' somewhere on the head. Likewise the color and size of legs and feet agree with the Mallard in both the cases in which the two parents differ in this respect. The curly tail coverts, likewise, appear in three out of the four cases, and may very probably have been present in the fourth. On the other hand, size, shape and color of bill agree with the other parent, in both cases where the two differ in this character. Finally, the new characters appearing in the hybrids are worthy of special attention. These are two, the green speculum in the Pintail hybrid, and the rufous markings on the lower tail coverts in both Black Duck hybrids. The first of these, being an iridescent color, may perhaps be really the manifestation of intermediate structure. The second is not easy to explain.

THE BIRDS OF CUSTER AND DAWSON COUNTIES,  
MONTANA.<sup>1</sup>

BY E. S. CAMERON, F. Z. S. L., M. B. O. U.

*Plates XV and XVI.*

92. **Phalaenoptilus nuttallii.** POOR-WILL.—Common in both counties. Arrives from the middle to the end of May. I have not heard it call after the end of August. Poor-wills begin to fly about at dusk and are seldom seen, but on every ranch "those shadowy birds, consorts of bats and owls, — those scarce-embodied voices of the night," are heard during June and July. The Poor-will would rarely be seen by daylight without a dog to start it from the long grass and sage-brush in which it lies. On May 27, 1894, a collie flushed three together on Ten Mile Creek, Custer County, when two were shot by a 'tenderfoot' which proved to be both females. Each contained an egg which in one was ready to lay. Poor-wills bred upon my ranch near Terry, and in 1898 the young could fly on August 21. They visited the water-troughs at my ranch in Dawson County of an evening, and on June 9, 1906, three alighted on the hitching post about 7.30 p. m. Here two fought while the third looked on, the combatants uttering their cry of poor-will and a peculiar booming or croaking which differs from the noise made by the Nighthawk. Unlike the eggs of the latter, those of the Poor-will are scarcely ever seen; the bird seems to possess an unusual instinct for laying them in out of the way places. On June 26, 1907, Mr. M. M. Archdale flushed a Poor-will from her two white eggs on a steep hill-side in some rough pine brakes at his ranch near Knowlton. In this unfrequented place the eggs were fully exposed on the bare earth amidst the pines. On June 28, we went together to the place intending to photograph the eggs, but they had been already removed by the bird.

93. **Chordeiles virginianus henryi.** WESTERN NIGHTHAWK.—Abundant. Ubiquitous in both counties. Arrives, on an average, in the first week of June, and leaves during the first week of September. By the end of August Nighthawks are very scarce. On June 28, 1903, sixty-nine of these birds passed me flying west at 6:30 p. m., when riding at my ranch in Dawson County. During July, 1905 and 1906, from fifty to sixty might be counted almost any evening from the door at the same place. Their manner of flying was to give twelve rapid wing beats and then sail in circles. Nighthawks lay their two eggs in any open situation in the badlands or on the prairie indifferently. They probably rear two broods

<sup>1</sup> Continued from p. 270. For maps of the region see maps facing p. 244.—*N. B.* On map of Dawson County, for "Scale, 12 miles=1 inch" read Scale, 18 miles=1 inch. On map of Custer County, for "Scale, 12 miles=1 inch." read 19.4 miles=1 inch.

in the year, as I have found both eggs and full-feathered young at the end of July. The male assists in the duties of incubation. Young full-feathered Nighthawks, before they can fly, have chestnut and black upper parts, black primaries with narrow buff margins, and are pale buff beneath. The mother gives a call of *cheep cheep* when she thinks her nestlings are menaced and performs extraordinary antics.

94. **Aéronautes melanoleucus.** WHITE-THROATED SWIFT.—Rare. Transient. Mr. Dan Bowman has observed this bird on the Powder River, Custer County. I have not seen it.

95. **Trochilus colubris.** RUBY-THROATED HUMMINGBIRD.—Rare. Mr. Dan Bowman has described Hummingbirds to me observed by him at different times in Custer County, which undoubtedly belonged to this species. He thinks that in the summer of 1888, a pair nested on his ranch by the Powder River, as they were seen about the garden for six weeks attracted by the petunias, four o'clocks, and marigolds which grew there. Miss Mildred Myers recollects that about seven years ago a pair of Ruby-throated Hummingbirds nested in a clump of rose bushes at Miles City, where the residence of Senator McLean is now situated. She frequently saw the nest, which contained two pearly white eggs about the size of peas.

96. **Stellula calliope.** CALLOPE HUMMINGBIRD.—Rare. Mr. Dan Bowman informs me that a male of this species was several times seen by him and his wife, to hover over a bed of flowering sweet peas at Knowlton, Custer County, in September, 1899.

Mr. F. Z. Gray states that some years ago a pair of Calliope Hummingbirds nested at the Mason ranch, situated between the heads of Sheep and Trail Creeks, being attracted by the numerous flowers in Mrs. Mason's garden.

97. **Tyrannus tyrannus.** KINGBIRD.—Common in both counties on the river valleys. Scarce in the pine hills excepting on the spring migration when small flocks may be seen. Kingbirds arrive about the middle of May, but, as with Say's Phoebe, the time of arrival is irregular. They were more common on my ranch near Terry, Custer County, than I have noticed them elsewhere, and are late breeders, the newly fledged young first appearing at the end of July. Kingbirds nest in the wild fruit trees, box elders and young cottonwoods, generally at a low altitude. In 1900, a pair of Kingbirds built their nest in a box elder tree close to that of the Marsh Hawk on the ground, and by their persecution distracted her attention from any intruder. In this they did me good service, by preventing her from stooping at my head, but they harried the poor hawk to such an unmerciful degree that it was a complete mystery how she could endure such attacks patiently. However, the Kingbirds were none the worse. The passiveness with which large hawks will submit to aggressive Kingbirds has always astonished me, and it must be assumed that their feelings alone are hurt by the persecution. The Kingbird alights on the back of Swainson's Hawk, remains there pecking at it for a couple of seconds, and, no matter how high the hawk may soar, the small aggressor will keep above

it renewing the attacks at intervals until both are lost to view. The hawk responds to each assault by merely giving sluggish downward flaps when it again soars on motionless wings as before.

98. **Tyrannus verticalis.** ARKANSAS KINGBIRD.—Abundant summer visitor. Ubiquitous in both counties; nesting in all kinds of trees, at any elevation indifferently. Arrives about the middle of May, young are generally fledged about the middle of July, and by Sept. 20, all the birds have left. Arkansas Kingbirds lay from three to five eggs and, like the next species, occasionally steal the nests of other birds. One pair drove away two robins and took possession of their nest. On July 8, 1893, I made the unusual discovery of these Kingbirds nesting in a colony on a fork of Whitney Creek, Custer County. The nests were placed in the forks of young cottonwoods, some contained eggs and others young birds nearly ready to fly. The male indulges in a curious display when courting the female. He makes successive darts in the air, fluttering, vibrating his quills, and trilling as he shoots forward. Propelling himself thus for several hundred yards, he looks like a bird gone mad. This species shows equal courage in attacking the Raptore as the last mentioned. On July 12, 1904, as my wife and I were driving through cottonwoods on the Yellowstone, a young Sparrow Hawk rose from the ground which was immediately struck down by an Arkansas Kingbird before it could clear the trees. I picked up the dazed hawk and took it home when next day it was sufficiently recovered to fly about half a mile before alighting. This showed that the hawk had not fallen from weakness, but from the force of the onslaught.

On July 1, 1905, we watched an Arkansas Kingbird attack a female Red-tailed Hawk which was disturbed from her nest in a cottonwood. The Kingbird constantly alighted upon this powerful hawk, once upon her head, and pecked her repeatedly, while the latter made no attempt to retaliate, but merely flew in circles uttering her quavering scream.

99. **Sayornis saya.** SAY'S PHŒBE.—Common summer visitor. Arrives at any time between April 5 and April 30. This bird, like Cliff Swallows, adopts the two extremes of nesting about buildings and in remote badland solitudes. Unlike the latter it shows small discernment in the choice of a site, the nests are placed on or against logs under low eaves, or on any convenient ledge, where the young must inevitably fall victims to ranch cats. If for any cause compelled to desert the first nest, Say's Phœbe will build a second in another similar situation. Five eggs are laid. A pair of these flycatchers made a peculiar unattached nest on a slanting board at the back of my house in Dawson County, and ingeniously built up the lower end to make the inside level. As usual this nest was at such a low elevation as to be at the mercy of any predatory animal. While these birds excel as architects and make substantial nests of grasses and fine roots lined with such material as wool and feathers, they are not above appropriating the nests of other species. In this latter case they can rear a brood safely. In May, 1895, a pair took possession of a Barn

Swallow's nest in the stable and forced the rightful owners, which were renovating it, to build an entirely new one affixed to a beam. In 1904, a pair of Say's Phœbes nested below the eyrie of the Golden Eagles and were unmolested. Another pair which, in 1906, built in a hole near the Prairie Falcon's eyrie (on one of the highest buttes along the Yellowstone) were killed by the latter for their young. In May, 1907, a still more remarkable site chosen by these flycatchers was the old abode of a Cliff Swallow; one of several nests situated above a wolf-den in a huge sand rock. The den was inhabited by a she-wolf with her six pups, and the birds were exposed to constant disturbance, both from these animals and from men who suffocated the young wolves with a pitch pine fire. The she-wolf escaped with one ten weeks-old pup and intermittent efforts were made to trap her at the den. Nevertheless the flycatchers did not desert their nest.

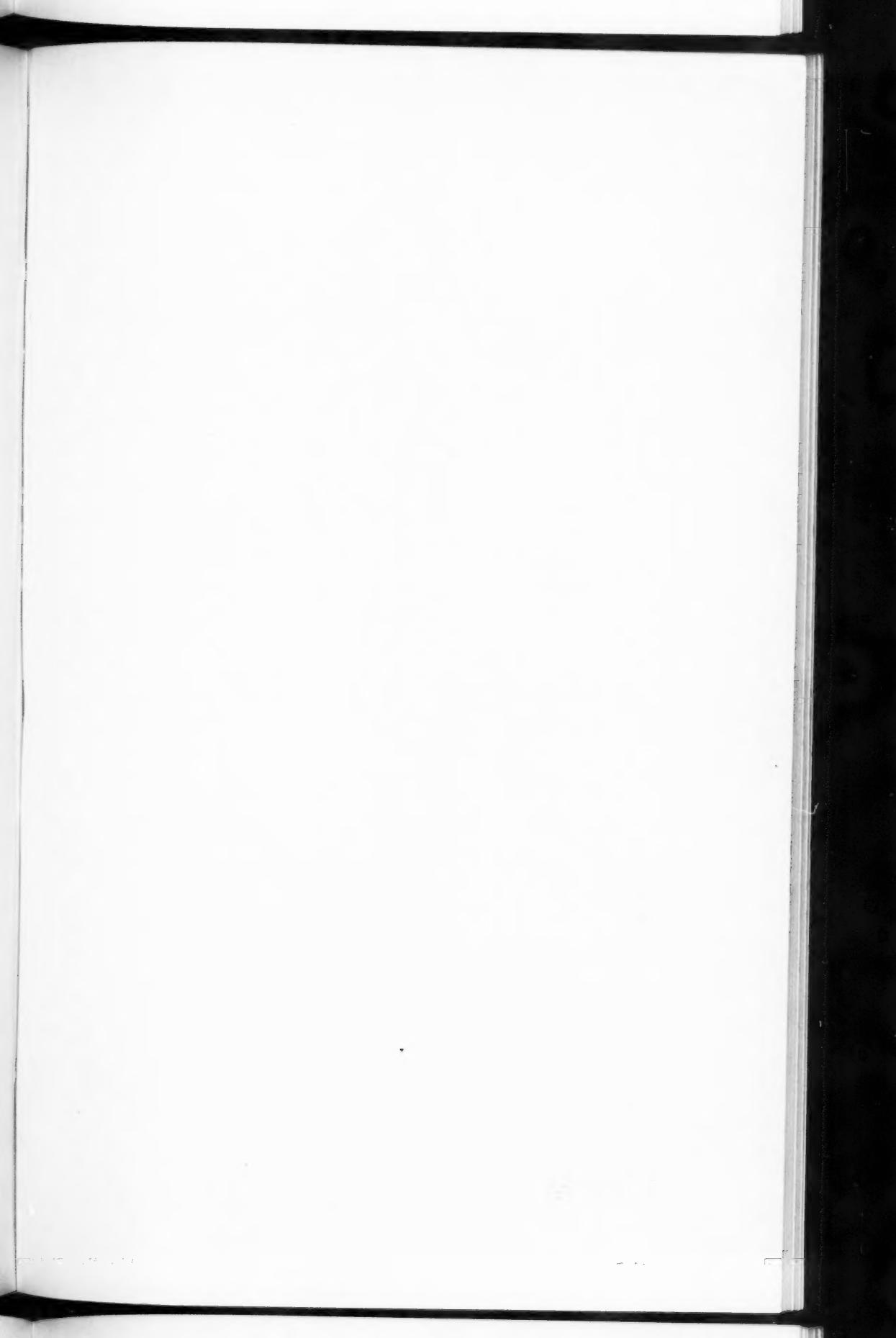
100. **Contopus richardsonii.** WESTERN WOOD PEWEE.—Rare. My wife has twice seen a single bird which came to our water-troughs in Dawson County, on March 21 and April 6, respectively, 1904. A pair was seen by me near Knowlton, Custer Co., on May 10, 1907. Captain Thorne gives this species as "Common. Breeds."

101. **Empidonax traillii.** TRAILL'S FLYCATCHER.—Rare. I observed a specimen in the shrubbery at my north window (Custer County), on May 18, 1894, and another remained there from May 11 to May 19, in 1896. Captain Thorne took one specimen on June 8.

102. **Empidonax minimus.** LEAST FLYCATCHER.—Rare. I saw an example of this flycatcher in the brush at my north window (Custer County) on May 25, 1893, and another on May 18, 1894. Captain Thorne gives it as "Not common."

103. **Empidonax hammondi.** HAMMOND'S FLYCATCHER.—Rare. I have not observed this bird. Captain Thorne obtained "two specimens—an adult July 17, and a young bird June 8."

104. **Otocoris alpestris arenicola.** DESERT HORNED LARK.—An abundant resident; ubiquitous in both counties. Immense flocks, which may number five hundred birds, reinforce the residents at the end of February. Of all prairie birds Horned Larks are the first to breed. I have seen their grass nests in depressions of the plain as early as the latter part of April; also at the end of June, showing that two broods are reared. Later nests are often lined with down from the pollen of a small daisy common on the prairie. Four eggs are laid and as was pointed out by Coues in 'Birds of the Northwest' (1874), both sexes share the duties of incubation. Newly fledged young run in the road ruts like their parents, and are sometimes trodden on by horses before they can fly. At this age they are sprinkled all over with white dots above and may be easily recognized. When her fledglings seem in danger the mother flies to, and runs from them, alternately, to induce them to follow her away. In winter Horned Larks frequent ranch buildings in search of food which they find in the hay stacks or in the droppings of cattle and horses. At this time cold and starvation render them so tame that they can be easily caught. (See Chipping Sparrow, No. 143.)



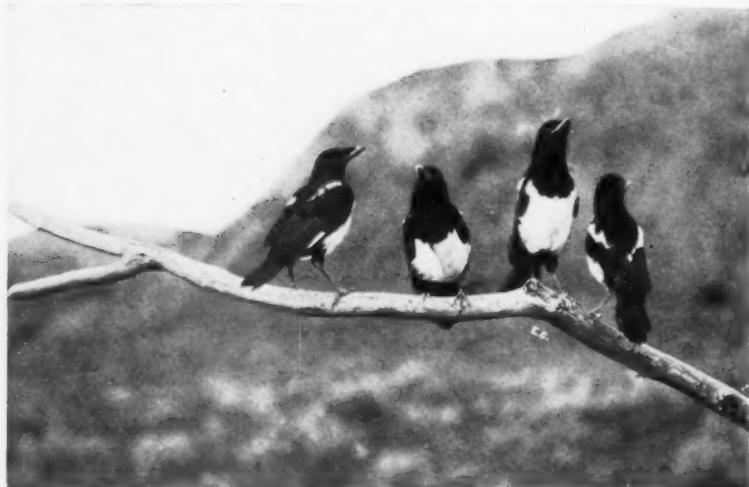


FIG. 1. YOUNG MAGPIES IN THE BADLANDS.



FIG. 2. PIÑON JAY'S HAUNTS ON COTTONWOOD CREEK, DAWSON CO., MONTANA.

In the fall of 1889, Captain Thorne "sent one hundred and eighteen skins of birds taken every month in the year, to the American Museum of Natural History, New York. They were examined by Dr. Jonathan Dwight, Jr., and pronounced to be "all *arenicola*."

105. *Pica pica hudsonica*. AMERICAN MAGPIE.—Common. More numerous in Dawson County than in Custer. Abundant in Custer County during the early nineties, where it was a source of much annoyance to trappers until exterminated by poison and traps put out for wolves. Increasing again now, in Custer County, during the last five years, especially around Knowlton, from a single pair which is believed to have come from Dawson County to Mr. J. H. Price's ranch. They nested at the latter place in 1902, and on February, 21, 1907, I counted eighteen Magpies in one of Mr. Price's pastures. Two pairs of Magpies nest annually on Cottonwood Creek which runs through the badlands near my ranch in Dawson County. There are altogether seven nests here, but three only have been used in the last four years. The broods number six or eight, and can fly by the middle of June. The full-feathered fledglings sit in the tree and have a habit of incessantly bobbing, or bowing, which renders them difficult subjects for the photographer. When the young birds think that the parents are away too long they keep up a monotonous clamor upon one note, precisely like the young Piñon Jay's shriek. Magpies perch on cattle for the 'warbles' which infest the hide, and also alight on the backs of horses and of the mule deer. The latter do not seem to appreciate this attention, and I have seen a doe push a Magpie from her back with her nose. I have found the Magpie to be one of the tamest birds in eastern Montana. On August 4, 1904, I approached within four yards of one sitting on a bush of the so-called yellow sage in the badlands. If encouraged about ranch buildings there is no limit to the boldness of this precocious thief.

106. *Corvus corax sinuatus*. AMERICAN RAVEN.—Rare. An occasional straggler to both counties. I have seen about half a dozen in 18 years. Mr. J. H. Price has not observed it. When on a hunting trip in 1898 a pair were twice seen; on Nov. 21 (on Cherry Creek) and Dec. 19 (on Cedar Creek) in Dawson County. At the latter date I had made a long and fatiguing crawl towards some recumbent antelope in high sage-brush when the low flying Ravens spoilt my stalk by frightening the timid game. Captain Thorne gives the Raven as "not common" but Dr. Edgar A. Mearns records it as "common" in his list of birds of Fort Custer. (Condor, Vol. VI, p. 21.)

107. *Corvus cryptoleucus*. WHITE-NECKED RAVEN.—Rare. One seen by my wife and Mrs. Gifford at the Gifford residence, Fallon, Custer County, on Sept. 14, 1902. It was flying south within range of a 16-bore gun.

108. *Corvus americanus*. AMERICAN CROW.—Not common. An irregular spring migrant in both counties. I saw a large flock on April 29, 1894, at my ranch in Custer County, but it is generally seen in small numbers.

In April, 1904 (as Mr. J. H. Price informs me), J. Anderson of Sheep Creek (Custer County) had much trouble in corralling his horses owing to a large flock of crows which alarmed the animals by cawing in the pines. Mr. F. Z. Gray saw a flock of forty crows at Knowlton on March 31, 1907. As far as I can learn the crow has not nested in either county since 1885, but old nests may still be seen (April, 1907). Fifteen, which are in Mr. Dan Bowman's pasture on Sheep Creek, are situated in ash trees about fifteen feet from the ground.

109. *Cyanoccephalus cyanocephalus*. PIÑON JAY.—Common in the pine hills of both counties. Occurs sporadically in roving flocks of from fifty to a hundred individuals in fall, but at least one resident flock inhabits the tract of rough country, some four by eight miles in extent, which is drained by Cottonwood Creek in Dawson County. (See Auk, Vol. XXIV, Plate VII.) This is an area of pine hills and badlands combined, practically impassable on horseback, and contains in its secure recesses not only the eyrie of the Golden Eagles, but, where bounded on the south by the Yellowstone, one of Prairie Falcons as well.

Here, where the buttes rise sheer from the water's edge, the Piñon Jays may be seen on the high peaks, either walking about the cliff or flying slowly along its precipitous face, when they strongly recall the Jackdaws of Great Britain. The same flock constantly frequent my ranch and drink regularly at the water-troughs, where their blue plumage against the green cedar background has a fine effect in bright sunshine.

When actually in the trees, Piñon Jays are hard to see on account of the thick branches, but being restless birds they constantly pass and repass through the scattered pines in straggling flight. Although their ordinary pace is slow, they can, when they like, fly very swiftly. Their presence is always proclaimed by their shrill cry of *wi-är whäck, wi-är whäck*; the last note short, but the first two notes long and high pitched like the caterwaul of a cat. Should a flock be disturbed when feeding in the pines, the first bird taking wing will warn the others by this cry, when they will follow leisurely, one at a time, until all are in flight and calling, the last to leave, however, being a long way behind the first. When flying to water they act in much the same manner. Piñon Jays have also a single call, like the cry of the young but harsher, and (as pointed out by Mr. Ridgway)<sup>1</sup> another "peculiar querulous note" like that of the Magpie in the love season.

That the cry of the young birds, both in and out of the nest, is precisely similar to that of young magpies, I can assert from my own experience, having been able to compare both at the same time. Although at the time of writing (April, 1907) only two nests of the Piñon Jay have been discovered, it is evident that many pairs must breed here, for I have seen and watched numbers of the newly fledged young which could only just

<sup>1</sup> North American Birds, by Baird, Brewer and Ridgway, Land Birds, Vol. II, p. 261, 1874.





FIG. 1. THE LAST PIÑON JAY FLEDGLING IN NEST.



FIG. 2. NESTING SITE OF SAY'S PHOEBE ABOVE A WOLF DEN.

fly across the gulches. The two nests mentioned were about four miles apart, and so far, I have found no evidence of the birds breeding in colonies here, as in the mountains, but judging from the size of the flocks it would appear that they undoubtedly do so. The paucity of nests met with is readily explained by the impenetrable nature of the country to be explored.

One of the above mentioned nests was only two miles from my ranch so that I was able to keep the birds under observation. The pair were first noticed to be carrying twigs on May 19, at which date the nest was about half-finished, both birds assisting in its construction. Without the guidance of the birds it is unlikely that I should have found the nest at all, placed, as it was, near the extremity of a thick pine bough and completely screened from observation except from above within the tree. The nest was of large size with a smaller interior cup, the whole of the exterior, together with a platform on which the cup rested, being composed entirely of dead greasewood sticks and a few rootlets. The width across the sticks was 14 inches, and the height of the nest 8 inches. The cup was very strongly made of dead grass, pulled by the birds into a material like tow, and so thickly matted together, that it remained intact when nearly all the surrounding sticks had been blown away. Some dead thistle leaves were woven into the rim. The inner cup was  $5\frac{1}{2}$  inches in diameter and  $2\frac{1}{2}$  inches deep. Although no clay was used in its manufacture the cup at first resembled the white clay lining of some nests and thus afforded charming contrast to the eggs in their bower of pine needles. By the time that the young were hatched the cup had turned from white to brown. The female began to lay apparently on May 24, as she was sitting on five eggs on May 28. To the best of my belief, both birds share the duties of incubation. The ground color of the eggs is pale greenish, spotted, streaked, and clouded with reddish brown and purple. As seen in the nest they are indistinguishable from handsome eggs of the Blackbird (*Turdus merula*). The naked slate-colored young were hatched on June 15, so that the time of incubation was about 18 days. They are fully feathered at two weeks old, being then a uniform lavender of exactly the same color as the flower of that name, with bill, legs, and feet to match. This hue is darkest on the quills and lightest on the crissum. After leaving the nest they became more ash gray, lighter below; the tail is then dark slate with a light tip, and the ends of the primaries almost black. Until after the fall moult the birds show no real blue. The irides are hazel. The adult female is a pale lavender blue, with the head blue; the male is a darker, more uniform blue. As pointed out by Coues<sup>1</sup> this blue is "very variable in intensity."

I regret to record that these interesting, but unfortunate, nestlings were hatched only to meet with a cruel fate, for on the very day after emerging from the shell (on June 16), they began to disappear at intervals, one after another, in a most perplexing manner. At first I attributed their loss to the violent gales which swept over the country, uprooting many pines,

<sup>1</sup> Key to North American Birds, p. 418, 1887.

but, on July 2, when only one full-fledged bird remained out of the five, I recognized the work of some other destructive and more mysterious agency. As there was no trace of the nestlings on the ground near the tree, and the nest was invisible from the outside, it was my belief that winged marauders, such as Marsh Hawks, must be responsible, although none of their kind had been seen near this badland grove. Certainly there were Sparrow Hawks, but the massacre of these innocents seemed alien to their habits when grasshoppers swarmed, as at the time in question. Wishing to save the last Jay fledgling and, if possible, solve the mystery, I sat down to watch with my field glasses on a deer trail where it wound near the summit of a steep distant butte. After a long wait my patience was rewarded by seeing a pair of Northern Shrikes fly straight to the Jays' tree. On this occasion the parents were at hand, and, assailing the miscreants with sharp cries, compelled them to retreat. I held the key, however, to this tragedy of the badlands, and I felt convinced that the sole survivor would ultimately follow its brothers and sisters.

Piñon Jays subsist chiefly on pine seeds, which they extract from the cones, and also on the soft embryonic cones themselves, detaching these with their tapering bills from the tasseled parent stem. Like Magpies, however, they are practically omnivorous, and a Piñon Jay has been known to meet its fate in a wolf trap by which destructive instrument so many of the former have perished. Like Magpies, too, Piñon Jays come about the ranch house in the hope of receiving scraps from the table, alighting but two or three yards from the door, or on the hitching post where the horses are tied. They are also very fond of insect food, and may be seen walking about as they turn over dried cattle manure in search of coleoptera. Mr. Dan Bowman informs me that in his locality (Knowlton) soft corn on the cob has a great attraction for them.

It is an interesting sight in June, to watch a flock of some hundred or more Piñon Jays which contains a large proportion of the newly fledged young. After the latter can fly well they still expect the parents to feed them, and clamor incessantly to be fed, repeating their shrill monotonous cry of *wauck* on a single note, whether on the ground or in the pine branches, voracious, open-mouthed fledglings walk towards the parents, flapping their newly acquired wings to attract attention. The old birds may then be seen supplying them with grubs and insects. I observed one female feed a single offspring on the ground several times in a few minutes. In midwinter, Piñon Jays seek deep ravines and love to sun themselves either on a bank or in the branches of low cedars which grow there. When thus sheltered these noisy, restless birds will sit motionless for some time without calling to each other. At this season their food seems to consist entirely of cedar berries.

110. **Molothrus ater.** COWBIRD.—Abundant summer resident of both counties, arriving in April. The manner in which Cowbirds associate with horses and cattle is no less interesting than remarkable. I have often noticed at my ranch (Custer Co.), when a saddle horse was turned loose,

how numbers of previously unseen Cowbirds would suddenly appear from space to perch upon him and run up and down on his back. Horses are corralled here which are covered with Cowbird excrement, and on June 3, 1894, I drove up my saddle horses with seven Cowbirds perched on the back of one of them. My neighbor, Mr. H. H. Tusler, has caught Cowbirds on horses with his hands.

In summer, when a bunch of cattle is driven to some outlying pasturage, Cowbirds often follow the drove for the whole distance, alighting constantly upon, or just in front of the animals. Many times it seems as if the birds cannot avoid being trodden on, but they just manage to run out of the way in time. Occasionally, the Cowbirds leave the cattle to dart after flying locusts which they catch very cleverly with their bills.

It would seem that Cowbirds sometimes attach themselves to particular cattle, follow them wherever they wander, and drink when they go to water. I noticed young Cowbirds, in August, 1905, which were inseparable from certain cattle of mine for at least a week. Two of these birds were quite buff in color with dusky streaks and easily distinguished.

I have found Cowbird eggs in the nests of the Long-tailed Chat, Brewer's Blackbird, Arctic Towhee, Vesper Sparrow, and Chipping Sparrow. I have seen them more frequently in the nests of the latter than of other species. Three Cowbird eggs are the most I have observed in any one nest. On July 25, 1896, I saw the empty, deserted nest of a Chipping Sparrow in a sage bush a foot from the ground. Underneath lay an egg of the sparrow and one of a Cowbird. For an exhaustive account of the parasitic nesting habits of the Cowbird in this region see Coues's 'Birds of the Northwest,' p. 181 *et seq.*, 1874.

111. **Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.—Tolerably common on migration, but the least numerous of the blackbirds which come here. Yellow-headed Blackbirds arrive about the first week in May and have disappeared by the end of September. They are also seen in the pine hills. Flocks which frequented the haymeadow, haystacks, and corrals in the fall at my ranch in Custer County consisted chiefly of immature birds. While the adult male presents such a splendid appearance, the immature young also show striking variations of plumage. One of these shot among other species of blackbirds in the corn on August 19, 1898, was colored as follows: The throat from the base of the bill was bright yellow, which extended to the breast, this color being divided from the chestnut sides of the head by a coal black patch under and including the eye. The crown, hind neck, and all other parts were black except some yellow feathers at the vent. The irides were hazel and the bird was ten inches long. Yellow-headed Blackbirds nest at several localities in Custer County. On June 17, 1905, my wife found these birds numerous at Brackett's ranch on Whitney Creek, and was told that they were nesting in the vicinity.

112. **Agelaius phoeniceus arctolegus.<sup>1</sup>** RED-WINGED BLACKBIRD.—

<sup>1</sup> See Oberholser, *Auk*, Vol. XXIV, p. 332.

Common on migration in both counties, arriving about the end of April, but more scarce in the breeding season as there are few suitable nesting sites. Large flocks visited my ranch (Custer Co.) in 1893, which were very destructive to the squaw corn, and destroyed all the corn (in the milk) belonging to a neighbor (Mr. H. Tusler) who was forced to cut it for fodder. These flocks seemed almost entirely composed of females and young birds, and seven which I examined were all immature examples. There was a small proportion of Brewer's Blackbirds and Bronzed Grackles among them. The Red-winged Blackbirds were never so numerous at any subsequent period while I lived on this ranch, owing to the fact that in the same year (1893), a pair of Marsh Hawks established themselves below the house and returned each succeeding spring. Both parents hunted incessantly to supply their young with food; together, or separately, they would beat the hillsides flying up and down the creek on which the two ranches were situated. This kept the blackbirds constantly on the move.

Like Brewer's Blackbird the Red-winged chooses all kinds of positions for its nest, and will sometimes place the latter as near the ground as the coarse slough grass will permit. A pool by the Yellowstone, about two miles east of Terry, used to be frequented by a colony of these blackbirds whose nests, interwoven with four or five growing flags and suspended two feet above the water were a pleasure to behold. On June 11, 1894, both fresh eggs and young birds were found; four eggs being the greatest number laid in one nest. Another nest observed on my ranch (Custer Co.), at the same time, and placed a few inches from the ground in a wild currant bush, was most inferior to the above charming style of bird architecture. On this ranch several pairs of Red-winged Blackbirds bred every year in a wet meadow, but reared very few young on account of the Marsh Hawks. On June 8, 1900, there were six nests; five in slough grass, which was here preferred to bulrushes, and one in a wild rose bush. The deep nests were made chiefly of the coarse marsh grass, which is called 'slough grass' here, and contained either four or five eggs. Unlike Brewer's Blackbird, the male of this species becomes most aggressive when the young are full fledged, and will strike an intruder on the head, constantly uttering a loud clucking. The newly fledged young hide in the slough grass and whistle softly. The Red-winged Blackbird has a short, charming song of five notes, in liquid quality of tone more nearly resembling a flute than that of any bird I know.

113. *Sturnella magna neglecta*. WESTERN MEADOWLARK.—Abundant summer resident. Ubiquitous in both counties.

From records kept over a period of eighteen years the average date of spring arrival is shown to be March 30, and of the fall departure October 20. The earliest appearance was March 20, 1907. The Meadowlark is always eagerly awaited here as the herald of spring, and, in the first week of April, pours forth its loud song from every conceivable situation. This has several different passages, but the usual song, which delights ranchmen, consists of a repetition of seven notes — the first long and the other

six short (two triplets). The birds' varied motives could be very easily rendered by musical notation, which I presume has already been done. Meadowlarks also sing on the wing, during rain and snowstorms and at night. I have seen three rival males singing against each other on the ground. Of the Western Meadowlark's song Dr. J. A. Allen<sup>1</sup> has written: "It differs from that of the Meadowlark in the Eastern States in the notes being louder and wilder, and at the same time more liquid, mellower, and far sweeter. They have a pensiveness and a general character remarkably in harmony with the half-dreary wildness of the primitive prairie, as though the bird had received from its surroundings their peculiar impress; while if less loud their songs would hardly reach their mates above the strong winds that almost constantly sweep over the prairies in the hot months."

Meadowlarks make their nests entirely of grass under the sage-brush or in tussocks of grass, and roof them over with the same material. They have either five, six, or seven eggs, beginning to lay about May 20, and sometimes rear two broods. On June 30, 1906, I noticed a bird sitting in a flowering cactus patch which was the prettiest nest I have seen. By the middle of June the young Meadowlarks can fly. In these the yellow is quite pale, but there is not much difference between the adult male and female save that the yellow at edge of wing is paler in the latter. Early in September the Meadowlarks collect in flocks on the open prairie when I have counted as many as fifty together. At my ranch in Dawson County, Meadowlarks are very fond of bathing in the overflow of the troughs with the other birds, and become the wettest of any. Several times individuals were observed which could scarcely take wing, and on August 14, 1904, my wife saw a Meadowlark incapable of flight after its bath.

Meadowlarks have many enemies, more especially Golden Eagles, Prairie Falcons, Marsh Hawks, and Red-tailed Hawks. A pair of the latter, which nested for several years, close to my ranch in Custer County, fed their young almost entirely upon these birds. Whereas heaps of Meadowlark feathers lay on a log near the tree, other remains were scarcely ever found, although the hawks did occasionally procure snakes and cotton-tail rabbits.

Numerous Meadowlarks reared their young in the vicinity of the buzzards' haunt, and this fact, conjoined to the unmistakable evidence that the Meadowlarks formed the staple bill of fare, had probably something to do with the site chosen for the nest.

On June 15, 1898, I surprised the female hawk just after she had seized a newly flown Meadowlark which was immediately dropped. Mr. M. M. Archdale has seen a female Marsh Hawk standing by a Meadowlark's nest and devouring the young birds. I have several times found Meadowlarks impaled, or hanging, on a barbed wire fence, and a few perish from the buffeting of spring storms. Mr. Dan Bowman took one of these storm-tossed birds into his house where it soon recovered, and, becoming ex-

<sup>1</sup> As quoted by Dr. Coues in 'Birds of the Northwest,' p. 191, 1874.

tremely tame, would fly after him wherever he went out of doors. It seemed likely to remain during the winter, but the migratory impulse was too strong and the Meadowlark left at the end of October. Nevertheless, like Brewer's Blackbird, the Meadowlark does sometimes stay for the whole winter. During the last winter, 1906-1907, no less than seven Meadowlarks remained on Mr. Al. Jordan's property situated on the outskirts of Miles City.

114. *Icterus bullocki*. BULLOCK'S ORIOLE.—Common summer resident of both counties on all the wooded rivers and creeks flowing through prairie country. Migrant stragglers occur in the pine hills, but I have not found Orioles nesting within this area. According to my notes, Orioles arrive about May 20, and have eggs by the middle of June. Females appear to arrive first. At my ranch in Custer County, where they nested, the Orioles used to make a loud chattering at 4 a. m., which might be continued until 6, during the end of May. On the Yellowstone their nests are suspended at a great height, often from upright branches, at the top of immense cottonwoods. They are usually made of horse hair, copiously lined with cotton down from the trees, and four or five eggs are laid. In marked contrast to the above, the nests on small, tributary creeks are only a few feet from the ground. Two nests may be found in one small cottonwood here, but Dr. C. Hart Merriam<sup>1</sup> quotes Captain Bendire who saw "as many as five occupied nests on a single small birch tree" at Fort Lapwai in Idaho.

115. *Scolecophagus carolinus*. RUSTY BLACKBIRD.—Rare. On April 26, 1903, I surprised a Sharp-shinned Hawk, which had just killed, and had commenced to eat, a Rusty Blackbird on my ranch in Dawson County. I took this specimen home, which was the only one I had seen hitherto. Later in the day my wife saw a small flock of seven or eight Rusty Blackbirds in the same locality.

116. *Scolecophagus cyanocephalus*. BREWER'S BLACKBIRD.—Abundant summer resident in both counties, arriving in April. In the fall immense flocks, which are largely composed of females and young, occur in prairie country, river valleys, and in the open parks amidst the pine hills. This is one of the tamest birds on ranches, even alighting on the veranda. Occasionally single individuals remain for the whole winter about the buildings. Brewer's Blackbird usually nests in small colonies, either in cottonwood trees or bullberry bushes fringing the creek banks, but also in single pairs upon the ground. In the latter situation the nest is placed under the sage-brush, or any small bush. A colony in bullberry bushes, growing by water, at a fork of Coal Creek (Custer Co.), had nests in every stage of progress, on June 28, 1905. Some were only just finished, while others contained nestlings; a few again held both eggs and young. Further on, newly fledged blackbirds were seen which presumably belonged to a first brood. These are of a uniform umber brown with bill, legs, and

<sup>1</sup> Results of a Biological Reconnaissance of south-central Idaho, p. 101, 1891.

irides dark brown. Brewer's Blackbird lays from five to seven eggs here, and, as, when building in trees, the vertical height of the bulky nest greatly exceeds the diameter, there is only just space for the latter number of eggs. The nests are made of grasses and stalks lined with mud. A flock of about a thousand blackbirds, entirely composed of this species, remained with Messrs. Undem's sheep on Bad Route Creek, Dawson County, during September, 1906. At daybreak, as the sheep gradually rose on their bed-ground, the dusky host swarmed over their backs to search for the ticks which infested them. Messrs. Undem informed me that both the Yellow-headed and Red-winged species sought their woolly charges for the same purpose, but in less numbers. This was the largest gathering of blackbirds that I had ever seen. The latest date on which I have observed them here was October 6, 1898, when a flock was washing in water partly frozen over.

117. *Quiscalus quiscula æneus*. BRONZED GRACKLE.—Common summer resident of both counties, in prairie country, arriving about the end of April. Casual in pines and badlands. This is a very tame, unsuspecting bird, alighting on the veranda, and being easily caught unhurt, if traps are set for it. In the two years 1895 and 1896, the date of the first arrival at my ranch (Custer Co.) was April 25. In both instances an adult male flew into the stable where it was caught, and examined, before being liberated. In these early arrivals, the upper back only was bronze, the head and neck green and blue, while the other parts, including the tail, were black. When alarmed, the birds spread their tails like a fan. An average male grackle measures a foot long, seventeen inches in extent, and weighs four ounces.

These birds nest here in the holes, or hollows, of dead trees, so that their nests are generally invisible from the outside. However, on June 1, 1893, Mr. H. Tusler showed me a nest of this species placed in a hollow formed by the fork of the two main branches of a box elder. Although well protected on all sides by wood, it was possible to examine this nest, which was only six feet from the ground, and made entirely of slough grass, with a thick, internal layer of mud. It contained six lovely eggs; a water color drawing alone does them justice.<sup>1</sup>

In 1894, there was a small colony of grackles in the large cottonwoods on the south bank of Yellowstone, below the Terry ferry crossing. All the nesting holes were high and very difficult to reach, excepting one where the nest was in the top of a burnt cottonwood stump, about twelve feet from the ground. The birds had eggs on June 3, and young hatched out on June 11, which both parents were feeding on crane flies. The greatest number of eggs in one clutch appears to be six, and by the middle of July the young grackles are flying about with the old birds.

118. *Coccothraustes vespertinus montanus*. WESTERN EVENING GROS-BEAK.—Appears to be a rare straggler. On June 6, 1900, a male of this

<sup>1</sup> A lady friend, an expert water color artist, painted two of these eggs for me.

species perched in the choke cherries at the ranch veranda in Custer County, where it sung loudly for some time. This song, which I thought was very fine, attracted me to the bird. My wife also heard it in the dark room, and afterwards told me it had reminded her of a Thrasher. Nevertheless, Mr. Townsend<sup>1</sup> has described it as "a miserable failure." So much for different opinions.

On August 23, 1904, a male Evening Grosbeak came to my water troughs in Dawson County and allowed a near approach. Captain Thorne gives it as rare. Dr. Edgar A. Mearns<sup>2</sup> mentions that "a small flock was seen beside the Bighorn River, near Fort Custer" (which was formerly in Custer County) at the end of July.

119. *Loxia curvirostra minor*. AMERICAN CROSSBILL.—Common in the pine hills of both counties. Crossbills may be seen during every month of the year and it is certain that they breed, although I have not found a nest.

It was not possible for me to give much attention to these birds until the three years 1904, 1905, 1906, when Crossbills of all ages and plumages were regular visitors to my water-troughs in Dawson County. During the first two years above mentioned, the birds came daily, in small flocks from the end of May until the middle of December, and when mixed with about the same number of Goldfinches, presented a most attractive sight. In cold weather, the Crossbills showed their intelligence by waiting for me to break the ice, singing subdued songs meanwhile, but ceased coming altogether after snowfall. From six to twenty was the average number of Crossbills seen daily at the water, but on June 6, 1905, I counted forty-eight in two flocks, which was the most ever observed here. As is well known, these birds are very tame, and will sometimes allow an examination within two or three yards. The most striking feature about these Crossbills is the variation in their plumage. Besides the vermillion and black of the adult males (which colors are seemingly brightest in November), and the grays or greens of females and young, I have seen the following mixed plumages: Vermilion and brown; orange and brown; olive green, with underparts and rump light green; also, a tricolor of brown, green and yellow. The rarest combination of colors remarked by me is a uniform bright green with yellow on the wings. In 1906, Crossbills were comparatively scarce, but young of the year began coming to the water on June 15.

120. *Leucosticte tephrocotis*. GRAY-CROWNED LEUCOSTICTE.—Abundant winter visitor.

The average date of arrival in the vicinity of Terry is October 25, and the birds leave about March 15. This species occurs in immense flocks in both counties, but appears to be very local and capricious. I have never seen it south of the Northern Pacific Railroad. My first experience of this

<sup>1</sup> North American Birds, Baird, Brewer and Ridgway, Land Birds, Vol. I, p. 451, 1874.

<sup>2</sup> Condor, Vol. VI, No. 1, p. 21.

bird was during the early days of February, 1893, when staying at the Macqueen Hotel in Miles City. I then observed a large flock for some days through the window; the birds remained in the cottonwood trees outside, and appeared paralyzed from cold and starvation. The weather was then terribly severe; forty-two degrees below zero had been registered on the first and second of the month. On the third instant, one of these finches, almost frozen to death, ventured into the hotel, through the front door (momentarily opened) and was captured alive. I endeavored to restore it, but the bird was too far gone, and shortly expired. When hunting mule deer in the Terry badlands (in Custer County), or in the red scoriaceous hills beyond (in Dawson County), large flocks of these birds add charm to the wintry landscape, as they balance on the tall rye grass, or whirl past in erratic curves.

Sometimes the flocks complete circles in the air, when they look like a variegated wheel of birds, or fly untiringly about the cedar thickets after the manner of Bohemian Waxwings. During snowy weather they allow an approach to within four or five yards when engrossed with grass seeds and withered dog daisies on the bare patches of the hillsides. If forced to rise, they sweep round in a dense cluster, and immediately return to the same spot — their wings making a loud, rustling noise.

Rosy Finches are very numerous at my ranch in Dawson County; I have seen about a thousand at one time by the water trough distributed in the pines and on the ground. A long stream of birds may keep flying into a draw for about a minute and be all lost to sight in the long grass upon alighting, but the same flock perched in a small dead cedar (completely covering it), is a remarkable and charming sight. The winter of 1905-06 was a great contrast to previous years, as for some inexplicable reason, no Rosy Finches appeared.

Writing of this species at Fort Keough, Captain Thorne states: "When it is cold and stormy they gather into the post by thousands. . . . They are often seen sheltering themselves in the old nests of Cliff Swallows."

121. *Leucosticte tephrocotis littoralis*. HEPBURN'S LEUCOSTICTE.—Common. I agree with Captain Thorne that this species occurs "with the last in about the proportion of one in twenty." On November 13, 1903, at my ranch in Dawson County, three remarkably tame birds came alone to the water-troughs.

122. *Acanthis hornemannii exilipes*. HOARY REDPOLL.—Rare. A Hoary Redpoll was observed by me at my ranch in Dawson County on March 9, 1905.<sup>1</sup> It was very tame, and in a flock of common Redpolls would have looked like a white bird.

Dr. Louis B. Bishop has a note in the Auk (Vol. XVIII, p. 195) of two Hoary Redpolls collected by Mr. C. F. Hedges, at Miles City, on February 26 and March 12, 1900.

<sup>1</sup> See Auk, Vol. XXII, p. 313.

123. *Acanthis linaria*. REDPOLL.—Common. An erratic winter migrant in both counties. Sometimes appearing in hundreds. Roving flocks of Redpolls may be seen at all times and in all places from October until the end of April. I saw numbers of Redpolls in the town of Miles City January 3, 1905, when the temperature was twenty below zero. In November, any flock of small birds, seen flying, will almost certainly be Redpolls. During the whole of this month, restless flocks flit through the pine hills, alighting on the ground to feed on sage-brush, and the ubiquitous weed which, a month earlier, is sought eagerly by Tree Sparrows. While thus scattered over the hillsides, a large flock seems to contain only about twenty birds, as so few are in sight, and these are perched on the sage tops, or on the withered heads of the aforesaid pink daisies. If the birds become alarmed, they fly to the skeleton branch of some dead cedar, when the reunited flock is shown to be ten times the number supposed. I have noticed that in these flocks the adult males, with carmine breasts, are in proportion of about six per cent. to the females and young of the year.

In midwinter, when deep snow covers the ground, large flocks of Redpolls may be seen on the prairie, eking out a scanty subsistence from sage-brush. Six or more birds, clinging to a single shoot as they endeavor to detach what few seeds still adhere, make a pretty sight.

On March 2, 1904, I was driving up cattle during a blizzard. The nearest heifer stepped on a sage-bush, when out fluttered a solitary male Redpoll, in splendid plumage, and attempted to alight on her hock. The heifer kicked at, and narrowly missed the bird, which seemed so dazed that it might, apparently, have been caught by hand. I have seen Redpolls chasing each other as though they were pairing, on March 22. At this time the males sing first after sunrise, or between six and seven.

124. *Acanthis linaria holboellii*. HOLBOELL'S REDPOLL.—Rare. Two skins of this subspecies were obtained by Mr. C. F. Hedges at Miles City, March 2, 1900. (See Louis B. Bishop, Auk, XVIII, p. 195.)

125. *Acanthis linaria rostrata*. GREATER REDPOLL.—Rare. Three specimens of this bird were obtained by Mr. C. F. Hedges at Miles City on March 1 and 6, 1900 (recorded in 'The Auk,' by Dr. Louis B. Bishop, as above).

126. *Astragalinus tristis*. AMERICAN GOLDFINCH.—Common summer visitor in both counties. Nests indifferently in pine hills and river valleys. At least two pairs of Goldfinches nested annually on my ranch near Terry, Custer County, and flocks came to my water-troughs in Dawson County.

127. *Astragalinus tristis pallidus*. WESTERN GOLDFINCH.—This subspecies is included by Dr. Mearns in his 'Birds of Fort Custer,' which was formerly in Custer County. (Condor, Vol. VI, No. 1, p. 21.)

128. *Spinus pinus*. PINE SISKIN.—Rare. Six came regularly to my water-troughs in Dawson County during July, 1906. Two were seen near Knowlton May 30, 1907.

129. *Passer domesticus*. ENGLISH SPARROW.—Tolerably common.

I first observed English Sparrows here on December 6, 1899, at Terry. These birds are now common in towns along the Northern Pacific Railroad, and are visitors to different ranches. Numbers frequented, and bred, upon the ranches of Messrs. Archdale and Price, near Knowlton, but all subsequently departed.

130. *Plectrophenax nivalis*. SNOWFLAKE.—Abundant. An erratic, but regular winter visitor in both counties. My records (from 1889) show that this species is most plentiful in February, may appear here as early as November 18, but is not seen after March 16. Snowflakes are more numerous in severe winters, and, associating with Horned Larks, form vast flocks numbering many hundred birds. They are fond of feeding on the haystacks at parts from which the hay has been fresh cut, and rye stacks possess a great attraction for them. In very cold weather their tameness is such that they may be caught with an ordinary stable fork, and during the first week of February, 1893, Mr. J. H. Price saw seven or eight Snowflakes which had been frozen to death. The birds show all shades of buff and gray, while some are black and white with buff heads. Snowflakes perch on corrals here, but I have never observed them to perch in trees, although this is a well known habit referred to by many ornithologists in different parts of the world.

131. *Calcarius lapponicus*. LAPLAND LONGSPUR.—Not common. An erratic winter migrant in very severe weather, associating with flocks of Snowflakes. On February 16, 1904, I kept under observation for two days twenty of these Longspurs, which consorted with several times this number of Snowflakes at my corrals in Dawson County. A flock of about fifty Redpolls nearby, did not mix with the other birds. Some of the adult male Longspurs had conspicuous chestnut on the back of the neck and blue throats, partly concealed by white feathers. Their plumage was altogether brighter than I had supposed from written descriptions. The Longspurs closely resembled the Snowflakes in their habits, and ran about swiftly inside the corrals or perched on the bars. Like the latter, they searched on the haystacks or manure heap, and, as with them, individual Longspurs became absolutely fearless, from the effects of cold and hunger.

132. *Calcarius ornatus*. CHESTNUT-COLLARED LONGSPUR.—Common summer resident in both counties; a typical prairie bird. Arrives in small companies early in May, but never, to my knowledge, in the large flocks characteristic of McCown's Longspur. It always associates with the latter bird, and I have found the nests of both species close together. Chestnut-collared Longspurs only frequent high tablelands, and are most numerous on the big flat about Terry (Custer County) between the Powder River and Fallon Creek, whose southern boundary is the pine hills around Knowlton. One of my pastures, at the commencement of this flat, was a favorite nesting site with them and *R. mccowni*. The birds are paired by the end of May, and set about making their nests of grass, lined with the same or cow hair, on the ground. These are invariably placed under a clump of wild oaks or tall weeds, and the sitting bird is below the surface

of the prairie. I have never seen more than three eggs or three nestlings, although Coues gives the number as four. Often, when riding over the plain, my horse almost stepped upon the sitting female which slipped, fluttering, from her nest into the depths of the surrounding grass. Here the bird would remain invisible but for her maternal anxiety which causes her to hover repeatedly on the wing, and if the horse is moved only a few yards, she at once settles down upon her eggs. The young are generally hatched out during the first week of July, when the parents of this species and the next (*R. mccowni*) run about in the herbage like mice. If the nest is actually discovered, they hover fearlessly above the intruder, and make impetuus dives into the grass. At this time, the females of both species share with Desert Horned Larks the habit of running long distances in the road-ruts directly in front of horses. The young are at first covered with buff-colored down, but when full-fledged (about the middle of July) become very dark gray, inclining to black, with white stripes on the wings. At pairing time, and during incubation, the males indulge in extraordinary tricks of flight, "singing as they fly, rising to a great height and letting themselves down with the wings held like parachutes; they curiously resemble butterflies when so engaged."<sup>1</sup>

By the second week in September the males have lost their nuptial dress, and before the end of the month the birds associate in immense flocks with McCown's Longspurs and Horned Larks. Early in October they leave for the South.

133. **Rhynchophanes mccownii.** McCown's LONGSPUR.—Summer resident; abundant in both counties. Arrives in immense flocks towards the end of April, and is seemingly a most punctual migrant, as my notes give April 26, 27, and 29, for 1897, '98, and '99 as the dates of first appearance. The birds, which scatter over the ground as they alight, hide in the horse and cattle hoof prints, or other holes, and allow themselves to be almost trodden upon before rising. A large flock was driven into the shelter of my ranch buildings, near Terry, during a terrific thunder storm on May 15, 1894. Stones were whirled about and struck against the ranch house, when the thoroughly soaked birds received such a buffeting that they were barely able to fly. McCown's Longspur is in all respects similar in habits to the previous bird (*C. ornatus*) excepting that in my experience the female *R. mccownii* lays four eggs instead of three. On June 22, 1894, I had ample opportunity for observing this species, as, my horse having run away, I was compelled to walk home, ten miles across the prairie. My way was enlivened by the handsome males, which hung above me, before sinking into the grass with a burst of song, in strong contrast to the dowdy, brown females which I frequently flushed from their nests. The eggs differ a good deal; the ground color may be green or white, and an egg may be entirely white, unmarked. Some of the young could fly feebly by July 10.

(To be concluded.)

<sup>1</sup> Key to North American Birds, by Elliott Coues, 1887, p. 359.

SUMMER BIRDS OF SOUTHWESTERN  
SASKATCHEWAN.

BY A. C. BENT.

*Plates XVII-XX.*

THE development of the great Northwest, the extension of its progressive railroad systems, with new towns constantly springing up and all of the older towns and cities rapidly increasing in size, the steadily increasing movement of American, Canadian and foreign settlers westward and northward, and the inducements offered by the Canadian government and the railroads for opening up new and desirable lands for agricultural purposes, are making such rapid and marked changes in the great wild-fowl breeding grounds of northwest Canada, that it seems worth while to record the conditions as we found them during the summers of 1905 and 1906. Even during the one year intervening between my two visits to this region, the change was so striking as to indicate the passing away within the near future of nearly all of the great breeding resorts of this interesting region. Many of the rarer, shyer and larger birds have already disappeared and the others are being rapidly driven farther northward and westward, beyond the reach of railroads and beyond the cultivated lands of the ranchmen. The disappearance of the birds is not due to persecution, as they are seldom killed, and their eggs are not often taken for food, but the prairies are being cultivated, the sloughs are being drained and the whole country is being settled up so rapidly that they will soon have no suitable breeding grounds left.

Our observations were conducted mainly along the line of the Canadian Pacific Railway from a few miles west of the eastern boundary of Alberta to about fifty miles east of said boundary in that portion of Saskatchewan which was known as Assiniboa prior to 1906; and we explored, more or less thoroughly, much of the intervening territory, including the Cypress Hills, twenty miles south of the railroad and Big Stick Lake, thirty miles north of the railroad. We visited nearly all of the lakes from Many Island

Lake on the west to Lake of the Narrows on the east and explored most of the intervening creeks running northward into these lakes from the Cypress Hills region, particularly Maple Creek, Skull Creek, Mackaye Creek and Bear Creek.

In 1906 our party consisted of Rev. Herbert K. Job, of Kent, Conn., Mr. Chester S. Day of Boston, Mass., and the writer. I arrived on May 29 and left on June 17. The others arrived a few days earlier and Mr. Job remained a week after I had left.

In 1906 Dr. Louis B. Bishop of New Haven, Conn., and I reached Maple Creek on June 5; I was obliged to leave for home on July 1, but he remained until August. Mr. Alfred Eastgate of North Dakota joined us two weeks later, as taxidermist and general assistant. And Dr. Jonathan Dwight, Jr., of New York, joined the party after I left. Thus we were able to observe the last week of the spring migration in 1905 and a large part of the adult shore bird fall migration in 1906. I am indebted to all of these gentlemen for the use of their notes and particularly to Dr. Bishop for much valuable assistance in the comparison of material and the determination of subspecies. I also wish to acknowledge the kind assistance of Mr. William Brewster and Mr. H. C. Oberholser in identifying material. Specimens were collected of nearly all the birds on the list and where none were taken this fact is mentioned. Birds seen by others than the writer are entered on the authority of the observer. The only published list of the birds of this region that I have seen is contained in Prof. John Macoun's 'Catalogue of Canadian Birds,' to which I shall make occasional reference and endeavor to point out a few cases where our observations were at variance with this list. I am indebted to Prof. Macoun also for much valuable information regarding this region and for assistance in obtaining permits to collect.

The general topography of the region under consideration was rather uninteresting; the first impression of it was disappointing and it was not until we had made a more intimate acquaintance with its more highly favored sections that we began to realize its wonderful possibilities as a collecting ground. The contrast between the level, fertile prairies of western Manitoba and the desolate rolling plains of Saskatchewan was well marked. These plains were nowhere extensively level and were often quite hilly.





FIG. 1. ON THE PLAINS NORTH OF MAPLE CREEK.



FIG. 2. CYPRESS HILLS.

They exhibited three distinct types of soil, supporting three different kinds of vegetation and were more or less distinct faunally. For convenience I shall designate them as the prairies, the sandhills and the alkaline plains.

The prairies were practically devoid of all vegetation except a sparse, short growth of grass, which grew most sparingly on the hills and more luxuriantly in the hollows. A few scattered small rose bushes, stunted bits of sage-brush and two species of low-growing cacti, occasionally met with, were all that we found to relieve the monotony. The soil was hardly rich enough for cultivation, though wheat and flax were being successfully raised in many places with the aid of a little fertilizing; but for grazing purposes these portions of the plains, which comprised by far the greater part of the whole region, were well adapted and large scattered herds of horses, cattle and sheep roamed at will over vast areas. Thirty years ago the last of the buffalos disappeared, but their trails were still visible in many places — narrow, deeply worn pathways where countless herds had passed along in single file. Many of their wallows were also recognizable, but their bones had long since been picked up and sold; only an occasional skull or horn was to be found. Antelopes had been frequently seen in recent years but they were fast disappearing. Prairie wolves were not yet rare and we obtained several shots at them, at long range, but succeeded in killing only one. Badgers were fairly common and gophers were only too numerous. Birds were scarce on the prairies or so widely scattered that they appeared so. Long-billed Curlews and Bartramian Sandpipers found congenial homes in the grassy hollows; gulls were occasionally seen, particularly near the lakes; hawks were frequently seen sailing overhead or perched on fence posts or telegraph poles along the railroad, and if one had sharp ears he could often hear the flight song of Sprague's Pipit or more rarely see one soaring way up in the sky, a mere speck against the clouds. But the characteristic birds of the prairies were the Longspurs, Lark Buntings, Vesper Sparrows and Meadowlarks, and their delightful songs added much charm to a drive across the grassy plains.

Among the sandhills, though the soil was poorer and the ground often bare and sandy, there was sufficient nourishment to support

a considerable growth of underbrush, extensive patches of rose bushes, sage-brush and various willows, forming in some places dense thickets of the large willows, growing eight or ten feet high, with a few scattered poplar trees among them. The sandhills were the favorite resorts of the Prairie Sharp-tailed Grouse where they found congenial shelter among the willows and convenient dusting places in the sandy hollows. Nearly every available solitary tree — poplars, cottonwoods and willows — in such places was occupied by a hawk's, owl's or crow's nest, seldom more than 15 feet from the ground. The underbrush offered a congenial home for Clay-colored Sparrows where we found a number of nests in the small 'silver willows' and 'badger brush', close to the ground.

I designate as alkaline plains certain flat, level areas, sometimes two or three miles wide, which were probably once the beds of alkaline lakes, where the soil was strongly alkaline, forming slimy mud in wet weather, or baked hard and dry under the hot summer sun. Very little grass would grow in such places but the plains were well covered with a stunted growth of sage-brush and cactus. An occasional Burrowing Owl could be seen on the plains, but the characteristic birds of the region were Horned Larks, Vesper Sparrows and a few Lark Buntings, none of which were abundant. With this brief description of the three classes of plains, which in the aggregate comprised fully 95 per cent. of the whole region, we will leave this comparatively uninteresting phase of the subject and consider some of the more highly favored localities which we found much richer in bird life and therefore of much greater interest ornithologically.

The timber belts along the streams, or 'creeks' as they were called, proved to be the most fruitful collecting grounds and were fairly teeming with small birds of many species. Many of the creeks were practically treeless or nearly devoid of underbrush for long distances, but a large portion of Skull Creek and nearly the whole upper half of Maple Creek were more or less heavily timbered. The largest trees, poplars, balsms, cottonwoods, willows and box elders were generally well scattered along the banks of the streams, sometimes towering above the surrounding small trees and underbrush to a height of 30 or 40 feet but more often not exceeding 20 or 30 feet. Scattered groves of box elders 15 or

20 feet high often occupied flood plain areas from 50 to 100 yards wide; and, as they were frequently irrigated at periods of high water, they often supported a rank growth of underbrush which in some places had developed into dense thickets of willows, thorns, and other high growing shrubs. Most of the timber was of this class, an open growth of the larger trees, with thick patches of underbrush and occasional dense thickets among them. We occasionally found, however, dense shady groves of small poplars, balsms or quaking aspens, about 15 or 20 feet high, entirely devoid of underbrush, occupying limited areas in well watered bottom lands. The streams were all small, meandering sluggishly through devious courses which had been deeply cut below the level of the plains, leaving frequently high 'cut-banks'; they were generally shallow enough to wade and often narrow enough to jump across. During periods of heavy rain the streams soon became very much swollen; during the first week in June, 1906, we were favored with an unusually heavy rain fall which caused a rise of fully 10 feet in Maple Creek, submerging much of the timber and flooding the surrounding plains.

The largest trees contained the nests of Ferruginous Rough-legs or Swainson's Hawks which were often visible for long distances, as they stood out plainly above the surrounding timber. Hunting for hawk's nests was therefore a simple matter as it was merely necessary to drive along on the high land and examine the large trees with a glass. The available nesting sites for hawks were so limited that we found their nests quite numerous in all suitable timber; ten occupied nests were examined in a single day's drive of about twelve miles. The deserted nests of the larger hawks were sometimes occupied by Horned or Long-eared Owls. The box elder groves made satisfactory homes for the Sparrow Hawks, where we found them nesting in natural cavities or in deserted Flicker holes. Birds were more abundant in the open box elder groves than elsewhere in the timber, among which the Western House Wrens were decidedly the most numerous and most constantly in evidence; the woods were full of their delightful little bubbling songs and every small cavity in the dead branches or weather worn trunks of the box elders would sooner or later contain one of their nests. Hybrid Flickers of various colors were

common and excavated their nest holes in any of the larger trees. Nighthawks were frequently seen flying overhead or perched lengthwise on the horizontal branches. Brewer's Blackbirds were exceedingly numerous and noisy, protesting vigorously at our intrusion but their nests were usually too well concealed in the low thick underbrush for us to find them. Arkansas and common Kingbirds were much in evidence and clamorous, as usual, both species being about equally abundant. Clay-colored Sparrows were abundant in the underbrush, particularly along the outer edges, where Yellow-throats and Yellow Warblers were also very common. Robins, Catbirds, Song Sparrows and Least Flycatchers were all fairly common, an occasional Arctic Towhee was seen and the voice of the Willow Thrush was frequently heard in the depths of the shady thickets near the stream, though the birds themselves were seldom seen. Many other less prominent species were noted, as well as a number of rarities which will be found in the list, but the foregoing will give a fair idea of the characteristic birds most frequently seen.

From 15 to 20 miles south of the railroad lay the Cypress Hills, extending for approximately 50 miles east and west, nearly parallel with the railroad and visible at a long distance, their irregular outline forming the southern boundary of our view, like a distant chain of mountains. They were, however, rather low-lying hills, probably not over 300 or 400 feet above the general level of the plains. All of the creeks that we explored had their sources in these hills and flowed in a general northerly direction to the lakes, Mackaye Creek running into Many Island Lake, Hay Creek into Hay Lake, Maple Creek into Big Stick Lake, Piapot and Bear Creeks into Crane Lake, and Skull Creek into Lake of the Narrows. We were unable to explore more than a limited portion of the Cypress Hills but found them full of interesting material and well worthy of more extended investigation. The approaches to the hills and the outlying spurs, or what might be called the foothills, were merely continuations of the prairies, but the higher portions were extensively wooded with a low growth of poplars, balsms, aspens, willows and various shrubs. The interior valleys contained several small lakes or ponds and were watered by small creeks or brooks, supporting dense thickets of alders and willows.

The hills in the interior were largely covered with fair sized pines and spruces; we were told that large tracts of heavy coniferous timber existed here; several piles of large logs that we saw and the log cabins of some of the settlers bore testimony to the truth of this report. Many of the birds seen in the Cypress Hills were common to the whole region but the following species were noted here which were not seen elsewhere: Western Wood Pewee, Alder and Wright's Flycatchers, American Crossbill, White-crowned Sparrow, Pink-sided Junco, Orange-crowned, Audubon's and Macgillivray's Warblers and Alma's Thrush.

The most striking features of the whole region, the real ornithological wonders of the great Northwest, were the breeding grounds of the water-fowl. In my attempt to give some adequate idea of these marvelous wild-fowl nurseries I cannot do better than endeavor to describe two or three typical sloughs and islands that we visited, though I realize that my words cannot but fail to convey the impressions I received, for such things must be seen in order to be appreciated.

Many Island Lake was in reality a many island marsh, irregular in outline and approximately 6 miles in diameter, consisting of a series of wet meadows, low grassy islands, deep sloughs full of bulrushes or cattail flags, shallow sloughs overgrown with long grass and open pond like areas. We could drive from one island to another by crossing the shallower sloughs at favorable spots, but often narrowly escaped being badly mired. The islands were so nearly indistinguishable from the marshes that we could form no idea as to their number or extent. Some of the more clearly defined islands in the more open portions of the lake formed suitable breeding grounds for California and Ring-billed Gulls, Common Terns and Avocets where they could make their nests on the higher portions or along the shores on dry ground. Killdeers, Spotted Sandpipers and Willets were evidently breeding on some of the islands; Wilson's Phalaropes were abundant, we found their nests on the grassy islands and saw large flocks of females flying about over the marshes; a number of Yellow-legs were associated with them and possibly some of them were breeding here. A cloud of Franklin's Gulls were hovering over an extensive deep-water slough where we found them established in a large breeding

colony. In the same slough Western and American Eared Grebes were breeding as well as numerous Coots, Bitterns, Canvasbacks, Redheads, Ruddy Ducks and Yellow-headed Blackbirds, but collecting in these sloughs was impracticable as the water was too deep to wade even with our longest waders. All of the commoner ducks were exceedingly numerous, such as Mallards, Pintails, Gadwalls, Baldpates, Shovellers and Blue-winged Teals, and were nesting on the grassy islands and in the meadows. A few Forster's Terns were seen, and Marsh Hawks and Short-eared Owls were flying about over the meadows. The whole region was fairly swarming with water birds and to merely mention the species we recorded gives but a very meager idea of their actual abundance. It is to be hoped that this locality, so well adapted for their requirements, will remain for a long time undisturbed. It is poorly adapted for agricultural purposes and is ten miles distant from the nearest settlement. There are no suitable camping sites near it, as firewood and good drinking water are not easily available, and the myriads of mosquitos which infest this locality make the collector's life miserable. If it could be set aside as a government reservation and the birds could be protected, it would prove a safe asylum for many years.

While exploring a long, narrow strip of gravelly beach which extended well out into the waters of Big Stick Lake, on which numerous Piping Plovers and Common Terns were nesting, we noticed a small island, about 300 yards from the shore, over which a cloud of gulls were hovering. Numerous Avocets were flying back and forth between the island and the beach, a flock of Pelicans flew off and settled on the island, various ducks were swimming in the lake near it, and everything seemed to indicate that we should find it well worth visiting. The next day, June 14, 1906, our guide hitched up a pair of horses and drove us out to it, through the shallow water, landing us on a narrow point of beach. It was a low, flat island, surrounded by gravelly or muddy beaches, largely bare on the higher portions, except for a scattered growth of coarse dead weeds, but supporting quite a thick growth of long grass on the lower or flatter portion. It may have contained more than one acre of land but certainly not over two acres at the most. As we landed a flock of American White Pelicans flew off from

the farther end and a great cloud of California and Ring-billed Gulls arose from the center of the island, but we devoted our attention at first to the American Avocets which had flown out to greet us with their yelping notes of protest. Their nests were placed in the short grass near the beach or on the windrows of driftweed which lined the shores. There were not over a dozen pairs in the colony. A small colony of Common Terns were nesting in the short grass, two nests of Spotted Sandpipers were found, Wilson's Phalaropes were flying about, and specimens of Northern Phalaropes and Semipalmated Sandpipers were collected. In the long grass we found a Pintail's nest with nine eggs in the process of hatching and five ducks' nests, with apparently fresh eggs, which we took to be Baldpates, though we could not identify them with certainty, as the birds were not incubating. On the higher portion of the island, among the tall dead weeds, we found three ducks' nests, referred to hereafter under the American Merganser, which we were unable to satisfactorily identify. The California and Ring-billed Gull colony occupied the whole of the main portion of the island, which was thickly covered with their nests; we could form no accurate idea of their numbers, as we did not have time to count the nests, but to say that there were at least 1000 pairs of each species would be a conservative statement. The nests of the Ring-billed Gulls were chiefly on the higher portion of the island, while those of the California Gulls were mostly around the shores and on a bare, flat point, though both species were somewhat intermingled where the two colonies came together. I should say that about half of the eggs had hatched, for we found hundreds of the downy young hiding among the scanty vegetation and saw them swimming out from the shores in large numbers. This island was visited again, by the other members of our party, on July 18-21, 1906, when they found the bird population of the little island increased by a nesting colony of fourteen pairs of American White Pelicans and four pairs of Double-crested Cormorants. On the neighboring shores of the lake and on the adjacent meadows and prairies the shore birds were well represented by numerous Long-billed Curlews, Western Willets, Marbled Godwits and Killdeers, all of which were breeding in the immediate vicinity.

The most interesting locality of all was the duck island in Crane

Lake and its surrounding sloughs at the mouth of Bear Creek, where the water-fowl were breeding in such great profusion and in such a limited area, less than one square mile, as to make it the crowning glory of the whole region. We spent considerable time here both seasons and recorded in all 35 species of birds, mostly water-fowl and shore-birds, that were either breeding or probably preparing to breed within this limited area. On the prairies and meadows near the lake we found scattered nests of various ducks, where Long-billed Curlews, Western Willets and Marbled Godwits were also breeding. On the shores of the lake and the island American Avocets, Killdeers and Spotted Sandpipers were nesting. The extensive deep-water sloughs, surrounding the island, which were filled with scattered clumps of tall bulrushes, concealed the nests of hundreds of Western Grebes, American Coots and American Bitterns. A fair sized colony of Franklin's Gulls was found and a number of nests of Horned and American Eared Grebes. Large flocks of Canvasbacks and Redheads were constantly floating in the lake or flying over us, though we succeeded in finding only a few nests of each. Small flocks of Ruddy Ducks frequently darted past us and we saw the gaudy little males swimming among the reeds. Thousands of Yellow-headed Blackbirds kept up a constant din all through the sloughs and Red-winged Blackbirds were nesting about the edges, where a few Soras were also seen.

The island was about 300 or 400 yards in length by about 100 yards in width, fairly high at one end and everywhere covered with a thick growth of long grass, through which were scattered on the higher portion numerous small clumps and in some places large patches of rose bushes, offering ideal conditions as a breeding ground for ducks. There were several small ponds near the center of it lined with fringes of cattails and bulrushes. On the lower portion of the island the grass was shorter, and where it extended out into a point the ground was bare. A colony of Common Terns occupied this point, which was also the favorite resort of a flock of White Pelicans which may have bred here later in the season. Marbled Godwits, Wilson's Phalaropes and Spotted Sandpipers were breeding here as well as Western Savanna Sparrows. A pair of Crows had a nest in the only tree on the island, a small

willow, and they must have fared sumptuously on stolen duck's eggs. A pair of Short-eared Owls had a nest on the island containing young in various stages of growth. On June 17, 1905, Mr. Job and I attempted to make a careful census of the ducks breeding on the island, by dragging it as thoroughly as we could with a long rope and recording the nests as the ducks were flushed. We were unable to drag the whole island as the rose bushes were too thick in many places, but in the course of two hours' work we recorded 61 nests, as follows: Mallard, 5 nests; Gadwall, 23 nests; Baldpate, 3 nests; Green-winged Teal, 2 nests; Blue-winged Teal, 10 nests; Shoveller, 7 nests; Pintail, 8 nests; and Lesser Scaup Duck, 3 nests. The ducks were identified to the best of our ability by eyesight; the female Gadwalls and Baldpates were very difficult to distinguish and there may have been more of the latter than we supposed, but certainly both species were nesting there, as we saw a number of males in the small pond-holes; the Green-winged Teals' nests were identified by seeing the female join a male of that species. We started a number of ducks, mostly Pintails, where we failed to find nests, which probably meant broods of young and which were not counted. Most of the sets were incomplete or fresh indicating that the ducks were only just beginning to lay; we therefore must have overlooked a great many nests, where the eggs were covered and no ducks flushed, as we found a number of such nests by accident. Considering these facts, making allowance for the unexplored parts of the island and judging from the immense numbers of ducks that were flying about or bedded out on the lake, I considered it fair to assume that at least 150 pairs of ducks were breeding or preparing to breed on this one island. In addition to the species above recorded, we saw on the island several American Mergansers, a White-winged Scoter and one Cinnamon Teal, making a total of 14 species of ducks which were probably breeding on the island or in the sloughs around it, of which we actually found the nests of 11 species. Prof. Macoun recorded the American Scaup Duck as breeding here, but we were unable to identify any with certainty; I found a nest in the slough near this island which I feel fairly confident was a Ring-necked Duck's nest, but I was unable to shoot the bird; these two species must therefore be considered of doubtful occurrence, at present. As may be imagined, it was with considerable interest and pleasant

anticipation that I revisited this island in 1906, but I was most keenly disappointed to find it practically deserted. Instead of the immense flocks of ducks which I had seen rise from the sloughs like clouds of mosquitos, only a few scattered flocks were seen. As we walked across the island expecting to see ducks flying up all about us, hardly a duck arose, and in place of the 60 odd nests that we expected to find only 3 nests were found. The mystery was soon solved by finding a nestful of broken eggs and bunches of yellowish hair clinging to the rose bushes. A coyote had been living on the island and had cleaned out all of the nests and driven the ducks away. The destruction of the bird population of the island had been still further carried on by a family of minks and the entrance to their den was strewn with feathers. Whether the ducks will ever return to this island or not is an open question, but probably they have moved to some safer spot.

Such were the conditions as we found them in the localities we visited and I have no reason to think that they were exceptional. I have no doubt that similar conditions still prevail throughout nearly all of the unsettled portions of the northwestern plains. We passed in the train many similar localities, which looked equally attractive, where birds were apparently equally abundant, and, had we selected some other section and worked it up as thoroughly, I have no doubt that the results would have been similar. But there can be no doubt that these conditions are rapidly passing away, and unless something can be accomplished towards setting apart some extensive reservations where the birds can breed in safety and be protected against the encroachments of civilization, the glories of this region will soon become mere memories of the past.

In the following list of species I have endeavored to follow, as far as possible, the nomenclature, as it now stands, in the present A. O. U. Check-List without attempting to adopt even such changes as are definitely decided upon. I realize that the list is far from complete, owing to the limited time devoted to field work, but it seems worth while to publish it as a basis for further work and as a contribution to our knowledge of the birds of an interesting region. I trust it will serve to throw some light on the distribution of certain western species and subspecies and help to define their breeding ranges more accurately.





FIG. 1. NESTS OF WESTERN GREBE.



FIG. 2. SLOUGH AT REEDY LAKE. NESTING SITE OF WESTERN GREBE.

1. ***Æchmophorus occidentalis.*** WESTERN GREBE.—Abundant in all of the deep water sloughs where its nests were floating in water from two to three feet deep, among the bulrushes. There was a very large breeding colony at Crane Lake in 1905, which had nearly doubled in size in 1906, so that it must have contained several hundred pairs. Eggs were found at various dates between June 8 and 26, and young birds were seen on June 8, 1905, but very few of the eggs were hatched before the end of June. We noticed a great mortality among these birds in 1905, finding their dead bodies floating near their nests or lying on them, sometimes two birds at one nest. We were unable to account for this unless it was done by muskrats, which were common in the sloughs. Most of the nests contained 3 eggs, some 2, some 4, and one the unusual number of 11; this last was apparently the work of several birds.

2. ***Colymbus holbællii.*** HOLBELL'S GREBE.—This species was recorded by Prof. Macoun at Indian Head, Assa., and at Snake Lake, Alberta. I saw a grebe at Crane Lake on June 7, 1905, which I took to be Holbæll's, but none were collected either season and no others were seen, so I consider my record very doubtful.

3. ***Colymbus auritus.*** HORNED GREBE.—Uncommon in 1905, rare in 1906. A few pairs were found breeding in the Crane Lake sloughs and, as they were quite tame, were easily identified, though none were taken. Nests were found on June 7, 1905, and on June 22, 1906, in the Western Grebe colony, containing from 5 to 9 eggs.

4. ***Colymbus nigricollis californicus.*** AMERICAN EARED GREBE.—Common. Breeding in all of the sloughs and laying usually 4 or 5 eggs. They were found breeding quite abundantly in a large breeding colony of Franklin's Gulls, at Lake of the Narrows, on June 10 and 12, 1905, at which time all of the eggs collected were fresh. Nests were also found on June 22, 23 and 26, 1906.

5. ***Larus californicus.*** CALIFORNIA GULL.—Common, on or about all of the larger lakes and about the garbage piles near the towns. A large breeding colony of this and the following species was found on an island in Big Stieck Lake, on June 14, 1906, at which time about half of the eggs had hatched.

Prof. Macoun recorded the Herring Gull as breeding at Crane Lake, but we did not meet with it at all and I am confident that the birds he saw should be referred to this species. We collected quite a series of large gulls and all of them were either *californicus* or *delawarensis*.

6. ***Larus delawarensis.*** RING-BILLED GULL.—Common. Seen regularly at all of the lakes we visited. The only breeding colony found was the one referred to under the foregoing species.

7. ***Larus franklinii.*** FRANKLIN'S GULL.—Abundant about all the lakes and sloughs. Small flocks of Franklin's Gulls were frequently seen, towards evening, skimming low over the meadows after the manner of swallows and apparently catching insects on the wing. An immense breeding colony of these gulls was found at Lake of the Narrows on June

9, 1905, where they were nesting in a large shallow bulrush slough. They occupied an area approximately 1000 yards long by 100 yards wide and by counting the nests in an area 10 yards square, I estimated that there were from 15,000 to 20,000 nests in the colony. Many of the eggs that we collected were heavily incubated and some of them were hatching at that time. We visited this colony in 1906 but were disappointed to find it entirely deserted, probably owing to the fact that the slough had been nearly dry earlier in the season when they were beginning to breed. We found three other, smaller, breeding colonies in 1906 at Crane Lake, Reedy Lake and Many Island Lake, finding eggs as late as June 26.

8. **Sterna forsteri.** FORSTER'S TERN.—Rare. A few birds were seen at Many Island Lake on June 18, 1906, and on July 9 two specimens were taken here by Dr. Bishop. This species is not recorded by Prof. Macoun farther west than Indian Head.

9. **Sterna hirundo.** COMMON TERN.—Common but nowhere very abundant. Found breeding at all of the larger lakes, principally on the islands. Eggs were found on June 1 and 7, 1905, on June 13, 14 and 15 and on July 9, 1906.

Scattering birds were frequently seen near the creeks at long distances from the lakes.

10. **Hydrochelidon nigra surinamensis.** BLACK TERN.—Common in certain localities, particularly shallow sweet water sloughs or wet meadows, over which a number of these terns were generally to be seen hovering. It was only in these shallow grassy sloughs that we found them breeding where their eggs were laid on floating masses of dead vegetation. They are late breeders. We did not find their eggs until June 24, 1906, when several fresh sets were collected.

11. **Phalacrocorax dilophus.** DOUBLE-CRESTED CORMORANT.—Although this species is recorded by Prof. Macoun as breeding at Crane Lake, I did not see it at all either season. But Dr. Bishop reports finding four nests, with from 1 to 3 eggs each, on the island in Big Stick Lake, on July 21, 1906. I visited this island on June 14 and 15, 1906, but no cormorants were seen. No specimens were taken but they were undoubtedly of this species.

12. **Pelecanus erythrorhynchos.** AMERICAN WHITE PELICAN.—Common. Flocks of pelicans were seen almost daily at Crane Lake and at Big Stick Lake, frequenting the islands, but I was unable to find them breeding. The others were more fortunate for on July 18 and 21, 1906, they found 14 nests on the island in Big Stick Lake, 4 with 1 egg and 10 with 2 eggs each. Either these birds are late breeders or their first nests had been destroyed. A large flock of pelicans containing at least 150 birds was seen at Many Island Lake on July 13, 1906.

13. **Merganser americanus.** AMERICAN MEGANSER.—Uncommon. One or two birds were seen by Mr. Job at Crane Lake on June 15, 1905, and we saw a flock of 11 birds here on June 23, 1906.

On the island in Big Stick Lake on June 14, 1906, we found 3 ducks'

nests which we were unable to identify, containing 4, 8 and 9 eggs respectively. The eggs greatly resembled Redheads' and the nests were profusely lined with white down, but, as the nests were built on dry ground, partially concealed among coarse dead weeds, they may have belonged to this species. No mergansers were seen in the vicinity whereas several Redheads were seen on the lake. According to my experience the Redhead always builds its nest in water in a slough, but this may have been a departure from its usual custom. I regret exceedingly that none of the eggs were collected. No birds of this species were taken.

14. *Lophodytes cucullatus.* HOODED MEGANSER.—Two young birds, identified by Mr. Eastgate as this species, were seen but not taken on the timbered portion of Maple Creek on June 30, 1906. This region is not well suited for their requirements and they were probably merely stragglers.

15. *Anas boschas.* MALLARD.—Uncommon, but frequently seen in pairs or singly at various lakes and on nearly all of the creeks. The only nests found, 7 in all, were on the island in Crane Lake, 5 nests on June 17, 1905, and one each on June 13, 1905, and June 23, 1906.

16. *Chaulelasmus streperus.* GADWALL.—Abundant everywhere, the commonest of the ducks. We found in all 29 nests from June 10 to 17 in 1905 and on June 18 and 23 in 1906. Most of these nests were on the islands in the lakes, but some of them were on the meadows or prairies which we found by flushing the birds as we drove along. Downy young were taken on August 3, 1906.

17. *Mareca americana.* BALDPATE.—Uncommon, but possibly commoner than we supposed, as it is difficult to distinguish, the female particularly, from the Gadwall. Frequently seen singly or in pairs on the creeks or in small pond holes, as well as on the larger lakes.

No nests were positively identified, but I am confident that we found at least 6 or 8 nests of this species, for they were certainly breeding on the islands with the other ducks.

18. *Nettion carolinensis.* GREEN-WINGED TEAL.—Rare. This species was undoubtedly breeding on the island in Crane Lake with the other ducks, as we saw them swimming in pairs in the little pond holes, and Mr. Job feels sure that he identified 2 nests, as belonging to this species, which we found here on June 17, 1905. Dr. Bishop also found and identified 2 nests of this species, shooting the female in each case, one in a meadow near Hay Creek on July 3 and one at Many Island Lake, on July 9, 1906, on dry ground among the bushes on a small island.

19. *Querquedula discors.* BLUE-WINGED TEAL.—Abundant. Found breeding on the islands and on the meadows near the lakes, 16 nests in all, between June 13 and July 9. One or more pairs of Blue-winged Teals were flushed from almost every little pond hole. Downy young were found on August 2, 1906.

20. *Querquedula cyanoptera.* CINNAMON TEAL.—Very rare or accidental. I saw and think I positively identified a male of this species on Hay Creek on June 1, 1905, and another at Crane Lake on June 17, 1905,

though my failure to collect either specimen renders the record doubtful. None were seen in 1906.

21. **Spatula clypeata.** SHOVELLER.—Abundant. This and the Blue-winged Teal rank next to the Gadwall in abundance. We found Shovellers breeding on all of the islands, on the meadows near the lakes and on the prairies at considerable distances from any water. Twelve nests were recorded at various dates all through the month of June. The birds were constantly in evidence on all the lakes and small pond holes.

Downy young were found on August 1, 1906, and eggs as late as July 9, 1906.

22. **Dafila acuta.** PINTAIL.—Common. Found breeding on the islands, on the meadows and on the prairies. One nest was found under a rose bush in the sand hills, one mile from the nearest creek and two miles from the nearest lake. Nests with eggs were found, 11 in all, from June 2 to 17, 1905, and broods of young were found on June 13, 1905, and on June 14 and 21, 1906. This duck is one of the earliest breeders. Pintails were more frequently seen on the larger lakes than elsewhere.

23. **Aythya americana.** REDHEAD.—Very common, about the larger lakes. Found breeding in all the sloughs. Nests were found on June 7, 1905, and on June 18, 1906. A few eggs of this species were generally to be found in all of the Canvasback's nests. These two species have a peculiar habit of building what we called dumping nests in which large numbers of eggs are deposited but apparently not incubated; we found two such nests, one of which contained 19 eggs, 9 of the Redhead and 10 of the Canvasback, piled up indiscriminately and some of them had rolled out of the nest which was partially broken down and evidently deserted.

24. **Aythya vallisneria.** CANVASBACK.—Very common. Large flocks of males were seen at Crane Lake and at Hay Lake, bedded way out from shore or flying about. We found them breeding in the Crane Lake sloughs. Nests were found on June 7, 1905, and on June 26, 1906. The nests were generally well concealed in the thick clumps of bulrushes and were hard to find. No birds were taken.

25. **Aythya marila.** SCAUP DUCK.—Of doubtful occurrence. This species was recorded by Prof. Macoun as breeding at Crane Lake, but, though we saw several that looked large enough to be of this species, none were collected or positively identified. No eggs were found which were referable to this species.

26. **Aythya affinis.** LESSER SCAUP DUCK.—Common. Found breeding at Crane and Hay Lakes; 6 nests were recorded, 3 on June 17, 1905, and one each on June 28 and 29 and July 3, 1906. These ducks were frequently seen swimming in pairs in the small pond holes and in the grassy, shallow places in the creeks, where they were quite tame. All of the Scaup Ducks that we collected were of this species. Downy young were found on August 2, 1906.

27. **Charitonetta albeola.** BUFFLE-HEAD.—Very rare or doubtful. A small duck was seen at Crane Lake in 1905 which was apparently a

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FIG. 1. NEST OF CANADA GOOSE ON AN ISLAND IN CRANE LAKE.



FIG. 2. YOUNG LONG-BILLED CURLEW.

Buffle-head. The species was recorded by Prof. Macoun as breeding in Alberta and at Rush Lake, Saskatchewan.

28. *Oidemia deglandi.* WHITE-WINGED SCOTER.—Rare. Only three pairs were located. One nest was found, containing 9 fresh eggs, on June 28, 1906. It was well concealed under a thick clump of rose bushes near a small slough.

29. *Erismatura jamaicensis.* RUDDY DUCK.—Common in all the sloughs, where it breeds. It occasionally lays its eggs in the nests of other ducks, particularly the Canvasback and Redhead. We found a Western Grebe's nest containing 2 eggs of the grebe and one of the Ruddy Duck. I also flushed a female Ruddy Duck from a small clump of bulrushes which contained only grebe's nests and I think she was preparing to lay in one of them.

30. *Branta canadensis.* CANADA GOOSE.—Common on all of the larger lakes. Although it is an early breeder, 2 nests containing 6 eggs each were found at Crane Lake, on a small island, on June 2, 1905; these were undoubtedly second sets.

The geese were seen flying about in small flocks on June 2 and 8, 1905, and on June 9, 1906. No birds were taken.

31. *Olor columbianus.* WHISTLING SWAN.—One was seen at Crane Lake, on June 23, 1906, by Mr. Eastgate, probably this species. We were told that they were very abundant on the larger lakes on the migrations, particularly in the spring, but, so far as we could learn, they had not been known to breed here within recent years. We saw a fine specimen in a local taxidermist's shop.

We could learn nothing definite about the occurrence of the Trumpeter Swan in this region.

32. *Botaurus lentiginosus.* AMERICAN BITTERN.—Very common in all the sloughs, nesting abundantly in the thick bulrushes or cattail flags, where 5 nests were found in one day. It was also found nesting in the wet grassy meadows and once on a nearly dry meadow in short grass. Nests with eggs were found on June 7 and 13, 1905, and on June 22 and 24, 1906.

33. *Ardea herodias.* GREAT BLUE HERON.—A colony of about 20 pairs was found breeding in the Skull Creek timber on June 5, 1905. The nests were from 15 to 25 feet from the ground in the tops of the tallest box elder trees, sometimes 2 or 3 nests in one tree. Most of the nests contained small young or heavily incubated eggs, from 4 to 6 in number.

We visited this rookery again in 1906 but were disappointed to find it entirely deserted though showing signs of recent occupancy. A search through the grove revealed the evidences of a camp, probably made by Indians, about which were scattered the wings and feet of our herons. They had killed or driven away every bird and probably eaten the eggs or young. No birds were collected.

34. *Grus canadensis.* LITTLE BROWN CRANE.—A mounted specimen was seen in a taxidermist's shop in Maple Creek, said to have been taken in that vicinity.

35. **Grus mexicana.** SANDHILL CRANE.—Only one crane, probably this species, was seen from the train on May 28, 1905.

This is one of the species that has probably been driven farther north since the country became settled. Nothing could be learned of its occurrence here in the breeding season in recent years.

36. **Porzana carolina.** SORA.—Probably commoner than we supposed, but restricted to the shallow sloughs or wet meadows, where we spent very little time. We found a few pairs breeding in such places and saw nests with eggs on June 24, 1906.

37. **Fulica americana.** AMERICAN COOT.—Common in all the sloughs. A great many nests were found on various dates, as early as June 7, 1905, and as late as June 24, 1906. No birds were taken.

38. **Phalaropus lobatus.** NORTHERN PHALAROPE.—Abundant migrant. A few may breed. Seen migrating on May 29, 1905, in large flocks with Sanderlings. One was seen at Hay Lake on June 15, 1905. Two were taken at Big Stick Lake on June 14, 1906, which were in breeding condition.

Dr. Bishop saw a flock of 100 at Many Island Lake on July 13, 1906, which was the beginning of the fall migration. He found them still more abundant at Big Stick Lake on July 19, 1906. Nearly all of the birds taken on these two dates were females.

39. **Steganopus tricolor.** WILSON'S PHALAROPE.—Very common on the wet meadows about the lakes and sloughs and on the islands, where its nest is concealed in the short grass. Nests were found on June 8 and 17, 1905, June 18, 21 and 24, and July 13, 1906, with eggs. Downy young, recently hatched, were found on June 17, 1905. Large flocks of females were seen flying about at Many Island Lake on June 18, 1906, accompanied by a few Yellow-legs.

The almost complete reversal of the domestic relation of the sexes in this species is very interesting. The females are larger than the males and much more brilliantly colored. Two females were frequently seen chasing a single male and paying courtship to him. I observed a male building a nest in which the female did not seem to be interested and, so far as I could learn, the males performed all the duties of incubation and took charge of the young. As soon as the eggs were laid the females gathered into flocks and left the males to perform all the domestic duties.

40. **Recurvirostra americana.** AMERICAN AVOCET.—Abundant about all of the lakes and most of the small alkaline ponds. We found no large breeding colonies, but saw many small scattered colonies, the largest of which may have contained 15 or 20 pairs. The largest colony was on an alkali mud flat at Hay Lake where the nests were mere hollows in the mud, among the scattered tufts of short curly grass with which the flats were scantily covered. Owing to their protective coloration, the eggs were very difficult to see, even in such an open situation. A few isolated nests were also found along the shores of the lakes and on the islands, notably at Big Stick Lake. Four eggs was the usual number but two nests were

found containing five eggs each. Nests with eggs were found on June 15, 1905, and on June 14, 1906. Downy young were found on June 15, 1905, and June 29, 1906.

The Avocets were on the whole the most striking and conspicuous birds of this region; they were constantly in evidence and noisy, flying out to meet us as we approached their breeding grounds and protesting all the time with their shrill piping or yelping notes.

They fooled us frequently as to the location of their nests by squatting on the bare ground, as if sitting on their eggs, and then flying off yelping at us if we drew near. They were very much at home on the water, swimming lightly and gracefully, and feeding in the shallow water by dipping their heads under, like the surface feeding ducks. As soon as the young were able to run their parents led them to the water where they swam off easily and rapidly.

While conducting their courtships, in May, the Avocets were always amusing and often grotesque in their movements, as they danced along the shore or waded in the shallow water holding their wings fully extended, tipping from side to side, as if balancing themselves. Sometimes they would run rapidly along, crouching close to the ground, frequently nodding or bowing and sometimes they would lie flat on the water or ground, with wings outstretched as if in agony. At such times they were very tame, apparently oblivious of all else, and could be easily approached.

41. **Gallinago delicata.** WILSON'S SNIPE.—Very rare. Prof. Macoun found it breeding at the east end of the Cypress Hills on June 24, 1894, at which time the young were able to fly. Dr. Bishop saw one at Hay Creek on July 6, 1906. None were collected.

42. **Macrorhamphus scolopaceus.** LONG-BILLED DOWITCHER.—An uncommon migrant. A few were seen or collected by Dr. Bishop and Dr. Dwight, as follows: one at Hay Creek on July 3, 20 at Many Island Lake on July 13, one on July 18, 2 on July 21 and 1 July 22, 1906, at Big Stick Lake. All of these were adults, probably the beginning of the fall migration.

43. **Actodromas maculata.** PECTORAL SANDPIPER.—Dr. Bishop and Dr. Dwight found a few adults at Big Stick Lake on July 18, 21 and 22, 1906, securing several.

44. **Actodromas fuscicollis.** WHITE-RUMPED SANDPIPER.—Recorded by Prof. Macoun as seen as far west as Crane Lake and as probably breeding at Indian Head. We did not see any either season.

45. **Actodromas bairdii.** BAIRD'S SANDPIPER.—"We found a flock of about 50 at an alkali pond, 10 miles north of Maple Creek, on July 17, and about the same number there on July 21. At Big Stick Lake we found a few July 18 and 21. They were common on alkali ponds east of Maple Creek, August 1 and until we left. Young first seen on August 1."—(Bishop.)

46. **Actodromas minutilla.** LEAST SANDPIPER.—"Spreadborough believes it breeds at Indian Head." (Macoun.)

"I shot 2 young birds at Hay Creek on August 2. No others, certainly of this species, were noted, though they were probably seen several times." (Bishop.)

47. **Ereunetes pusillus.** SEMIPALMATED SANDPIPER.—Common migrant. Flocks of small migrating sandpipers, apparently of this species, were seen at Hay Lake, as early as May 29, 1905, and as late as June 9, 1906. An adult female that would soon have laid was collected at Big Stick Lake on June 14, 1906. Probably a few breed here.

The return migration was first noted by Dr. Bishop on July 17, 1906.

48. **Calidris arenaria.** SANDERLING. Abundant migrant. Large flocks were seen and specimens collected at Hay Lake on May 29, 1905. Dr. Bishop took an adult male from a flock there on June 9, 1906, and 2 adult males from a flock at Big Stick Lake on July 19, 1906.

49. **Limosa fedoa.** MARBLED GODWIT.—Very common about all the lakes, breeding in the short grass on the meadows. Four nests with eggs were found on May 29 and June 8, 1905, and on June 9 and 23, 1906. Two broods of downy young were found on June 27, 1906. We saw them gathering into flocks, as if preparing to migrate, on June 27, 1906. For a full account of this species, see 'The Auk' for April, 1907, Vol. XXIV, pp. 160-167.

50. **Limosa haemastica.** HUDSONIAN GODWIT.—Probably occurs as a migrant.

"We saw a Godwit, with a white rump, feeding with a large flock of Marbled Godwits at Big Stick Lake on July 21 and 22, but could not secure it." (Bishop.)

51. **Totanus melanoleucus.** GREATER YELLOW-LEGS.—Possibly a few may breed here. We saw a few at Crane Lake on June 22, 23 and 26, 1906. Dr. Bishop shot a young female at Hay Creek on August 2, 1906.

52. **Totanus flavipes.** YELLOW-LEGS.—Probably a few breed here. Dr. Bishop saw one at Big Stick Lake on June 14, 1906, acting as if it had a nest.

A few were seen and one was shot out of a large flock of Wilson's Phalaropes at Many Island Lake, June 18, 1906. Birds were taken, probably migrants, during July and up to August 4, 1906, when our party left for home.

53. **Helodromas solitarius.** SOLITARY SANDPIPER.—"Tolerably common migrant. Adults first seen at Hay Creek on July 6. Young first seen at Maple Creek on July 30." (Bishop.) Specimens were taken on these dates.

54. **Helodromas solitarius cinnamomeus.** WESTERN SOLITARY SANDPIPER.—"Tolerably common migrant. Adults first seen at Maple Creek on June 30. Young first seen at Maple Creek on July 30." (Bishop.) Specimens were taken on these dates.

55. **Sympetrum semipalmata inornata.** WESTERN WILLET.—Very common about all the lakes; one of the most conspicuous and noisy of the shore birds. It was breeding on the high, dry prairies, often a long dis-

tance from water, but owing to its habit of flying a long distance to meet the intruder and making a great fuss everywhere but near its nest, we succeeded in finding only one nest. This was in plain sight in short grass on a prairie hill and on June 14, 1906; it contained 3 fresh eggs. Downy young were taken on July 6 and 13, 1906. In addition to quite a variety of loud calls and alarm notes, it has an interesting flight song; particularly towards evening, we often saw one of these birds, flying in large circles high in the air, pouring out a rapid stream of whistling notes, sounding like *pill-will-willet*, repeated over and over again for a period of several minutes.

56. **Bartramia longicauda.** BARTRAMIAN SANDPIPER.—Common on the prairies and meadows, breeding in the grassy hollows on the prairies, often at a long distance from any water, but more frequently near the lakes or meadows. The nests were always very well hidden by arching the grass over them. Nests were found with eggs, on May 29, June 8 and 15, 1905, and on June 11, 1906. Downy young were found on June 24, 1906. The birds are very close sitters.

57. **Actitis macularia.** SPOTTED SANDPIPER.—Uncommon. One or two pairs were generally to be found breeding on the islands. They were also occasionally seen along the creeks. Two nests were found on June 14, 1906.

58. **Numenius longirostris.** LONG-BILLED CURLEW.—Tolerably common in scattered pairs on the prairies. Also sometimes seen in small flocks of from 5 to 7 birds about the lakes. Breeds in the grassy hollows on the prairies. No nests were found with eggs. Downy young were found on June 1, 1905, and on June 11 and 18, 1906. When large enough to run the downy young are adepts in the art of hiding; they seem to disappear entirely even in the short grass; after hunting carefully, for fully half an hour, over a limited area where we had seen one vanish, we gave it up and walked away, when we were surprised to see the youngster get up and run away from the very spot we had been hunting hardest. Both parents always showed remarkable devotion and solicitude in utter disregard of their own safety.

We saw an interesting exhibition of this one day which probably succeeded in saving the lives of the young from a prowling coyote. The curlew was decoying the coyote away by feigning lameness, flopping along on the ground a few yards ahead of him, but always managing to barely escape him. We watched them for some time until they finally disappeared over a hill, fully half a mile from where we first saw them.

59. **Squatarola squatarola.** BLACK-BELLIED PLOVER.—Abundant migrant. Large flocks were seen about Hay Lake on May 29, 1905, and scattering small flocks were seen as late as June 2, 1905.

60. **Oxyechus vociferus.** KILLDEER.—Common about all the lakes where it was evidently breeding, but we did not succeed in finding any nests. Downy young were found on June 13, 1906.

61. **Ægialitis semipalmata.** SEMIPALMATED PLOVER.—Dr. Bishop

and Dr. Dwight each took one and saw a number on the sand flats at the eastern end of Big Stick Lake on July 19, 1906.

62. ***Aegialitis meloda.*** PIPING PLOVER.—Abundant at Big Stick Lake, where it was breeding on the gravelly beaches. No eggs were found but downy young were found on July 21, 1906.

The few birds we collected were referable to *circumcincta*, but I doubt if this form is worthy of recognition.

63. ***Pediocetes phasianellus campestris.*** PRAIRIE SHARP-TAILED GROUSE.—Very common in the sandhills and among the willow thickets, especially near Crane Lake and along Bear Creek. Also seen and collected in the Cypress Hills. Three nests with eggs were found among the under-brush in the sandhills on June 3 and 6, 1905. A nest from which the young had just hatched was found on June 4, 1905, and recently hatched downy young were collected on June 23, 1906. Half grown young, able to fly, were seen on June 27, 1906.

The grouse that we collected, in worn summer plumage, were so dark colored that we thought they might be *phasianellus*, but on comparing them with summer specimens of *campestris* in Dr. Bishop's collection, taken in North Dakota, we decided that they were undoubtedly *campestris*. This decision was further confirmed by the examination of material in the Biological Survey collection at Washington.

64. ***Centrocercus urophasianus.*** SAGE GROUSE.—Probably occurs sparingly, but common farther south. In June, 1895, Prof. Macoun found these birds breeding on the White Mud River and traced the birds up the valley of this river to its source in the Cypress Hills.

A bird was seen by Mr. Day, near Skull Creek, on June 9, 1905, which we think must have been this species, but it was not positively identified and none were taken.

65. ***Zenaidura macroura.*** MOURNING DOVE.—Very common in the timber along the creeks where it breeds. Nests with eggs were found on May 30, June 12 and 14, 1905, and July 19, 1906. Young birds were found on June 25, 1906. We frequently saw small flocks of doves feeding in the stubble fields and along the roadsides.

66. ***Cathartes aura.*** TURKEY VULTURE.—Uncommon, but probably of regular occurrence and undoubtedly breeding somewhere in this region. We saw a few sailing over the timber on Skull Creek, near the Great Blue Heron rookery, on June 5, 1905, and at the same place on June 25, 1906. None were collected. One was seen at Many Island Lake on July 13; two were seen in the Big Stick timber on July 19, and two were seen in the Cypress Hills on July 27, 1906, by others of our party.

67. ***Circus hudsonius.*** MARSH HAWK.—Hardly could be called common, still frequently seen on the prairies. No nests were found.

68. ***Accipiter velox.*** SHARP-SHINNED HAWK.—Rare. None were seen in 1905 and only 3 in 1906, 2 of which were shot in the timber on Maple Creek, on June 30 and July 5, 1906.

Prof. Macoun recorded a nest found on Farewell Creek, in the Cypress Hills, containing heavily incubated eggs on June 27, 1895.





FIG. 1. NEST OF FERRUGINOUS ROUGH-LEG.



FIG. 2. PRAIRIE SHARP-TAILED GROUSE ON NEST.

69. **Buteo borealis.** RED-TAILED HAWK.—None of our party saw any Red-tailed Hawk of any form, either season, except a mounted specimen which Dr. Bishop saw in a local taxidermist's shop. It was shot somewhere in the vicinity of Maple Creek. He did not examine it closely but thinks it was nearer *calurus* than *kridleri*. It was an immature bird. He and Dr. Dwight returned later to buy it, but it had been claimed by the party for whom it was mounted.

Prof. Macoun recorded the eastern form as breeding at Indian Head, so I have listed this bird as *borealis*, pending further knowledge on the subject.

70. **Buteo swainsoni.** SWAINSON'S HAWK.—The commonest hawk, breeding abundantly in all available timber, in isolated trees and even in bushes. One nest was found on a shelf on the face of a high sandbank. Thirteen nests were found in 1905 and 7 or 8 nests in 1906. Nests with eggs were found on the following dates: May 30, June 3, 5, 9 and 14, 1905, and June 11, 16, 18, 23 and 25, 1906. Nests with young were found on June 25 and 30, 1906.

It will thus be seen that these hawks are very late breeders; very few of their eggs were laid before June first.

The abundance of gophers in this region, provides a bountiful food supply for this and the following species, sufficient to support them in large numbers. Fortunately the ranchmen appreciate the value of these hawks in this respect and seldom disturb them, consequently they are very tame.

71. **Archibuteo ferrugineus.** FERRUGINOUS ROUGH-LEG.—Common. Breeding in large trees in the timber, in isolated trees along the creeks, and occasionally on the ground on buttes or rocky hillsides. The nests are very large structures, much resembling those of the Osprey. We found 7 nests in 1905 and only 3 in 1906, on the following dates: May 30, and June 4, 6, and 9, 1905, and June 27 and 28, 1906. All of these nests contained young, except one which was deserted and held broken eggs. Most of the young were hatched before the last week in May, and probably most of the eggs were laid before May first. Nearly half of the birds seen were in the melanistic phase and in two cases we found a light bird mated with a dark one. Two young were taken from a nest alive and reared in captivity, one of which developed into a melanistic bird and one into the light phase of plumage. (See Auk, XXIV, April, 1907, p. 213.)

72. **Aquila chrysaëtos.** GOLDEN EAGLE.—The only one seen flew almost within gunshot of us at Crane Lake on June 26, 1906. We could plainly see the golden hackles on its neck glistening in the sunlight, but did not succeed in shooting it.

73. **Haliæetus leucocephalus alascanus.** NORTHERN BALD EAGLE.—Doubtful. "Up Maple Creek on July 5 we saw a large gray eagle, that we were all confident was a young *H. l. alascanus*. It was seated on the top of a high cut-bank about 300 yards away. We saw it quite plainly as it flew and it seemed much too light to be the Golden." (Bishop.)

74. **Falco mexicanus.** PRAIRIE FALCON.—We saw several large fal-

cons but they were very shy and we could not get near enough to identify them, much less shoot them.

Both this species and the Duck Hawk have been recorded, as taken and found breeding, at various points not far distant, and it is fair to assume that both species occur here on migration and a few may breed here. Probably they are more common along the banks of the Saskatchewan River where they can find suitable nesting sites.

75. **Falco richardsonii.** RICHARDSON'S MERLIN.—Rare. I shot an adult male near Hay Creek on June 1, 1905, and Dr. Bishop and Dr. Dwight secured an adult female on July 17, 1906, about 15 miles north of Maple Creek. Two or three others, supposed to be this species, were seen elsewhere. Prof. Macoun gives several records of its breeding in this region.

76. **Falco sparverius.** AMERICAN SPARROW HAWK.—Common in the timber along the creeks in 1905, but less common in 1906. We found 6 nests in 1905 and only one in 1906. Nests with eggs were found on May 30 and June 5 and 14, 1905, and on June 30, 1906. The nests were mostly in natural cavities in the box elders but some of them were in old Flickers' holes. Both sexes incubate.

The birds that we collected were all in worn breeding plumage and were referable to *phalæna*, but I doubt if this subspecies is worthy of recognition.

(To be concluded.)

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## FURTHER NOTES FROM EXTREME SOUTHERN ILLINOIS.

BY JOHN F. FERRY.

THE extreme southern end of Illinois was visited by the writer from August 10-24 inclusive to carry on an ornithological investigation for the Field Museum of Natural History, Chicago. The region studied is included in the Austroriparian Faunal Area of Dr. Merriam. The heat and humidity are extreme and a corresponding luxuriance of vegetation is the result.<sup>1</sup> The birds were found in greatest abundance in the deep woods bordering Cypress Swamps. Dense thickets bordering roads and fields were also favorite haunts, though during the intense heat of mid-day these were deserted for the cooler shade of the woods. Generally speak-

<sup>1</sup> For list of characteristic trees and shrubs of this region see Auk, Vol. XXIV, July 1907, p. 285.

ing, birds were surprisingly scarce. A few of the commoner varieties were met in great abundance, *i. e.*, Cardinals, Tufted Titmice, Northern Yellow-throats, Field Sparrows and Indigo Buntings, but often the woods seemed entirely deserted. The birds as a rule were moulting and very ragged in appearance. Young birds of the year were much commoner than the adults. The time in the field was spent as follows: Olive Branch, Aug. 10-17; Mound City, Aug. 18-22; Grand Chain, Aug. 23-24, all inclusive. When a bird is said to be "common," etc., and no locality is mentioned, the status thus given refers to its abundance in the general locality here discussed.

Through the courtesy of the U. S. Weather Bureau at Cairo, I am able to give the daily conditions of the weather.

*Statement of Weather at Cairo, Ill.*

Aug. 1907	Temperature.		Precipitation.	Wind.			State of Weather.	
	Maximum.	Minimum.		Prevailing direction of wind.	Total daily movement.	Highest daily velocity.	Character of day.	Percentage of cloudiness.
10	91	74	.23	E	140	18	Clear	20
11	91	74	0	E	87	7	Clear	0
12	84	69	.79	N E	180	24	Pt. Cloudy	60
13	83	66	0	N E	239	18	Clear	10
14	88	68	T	N E	180	18	Clear	30
15	86	71	T	S	179	12	Pt. Cloudy	60
16	88	74	T	S W	207	15	Pt. Cloudy	70
17	82	70	.15	N E	198	29	Cloudy	90
18	86	66	0	N E	94	7	Clear	10
19	89	71	0	S	123	10	Clear	20
20	82	73	T	N	162	16	Cloudy	90
21	73	65	.02	N E	219	18	Cloudy	100
22	73	64	T	N E	120	10	Cloudy	100
23	82	68	.17	S W	161	17	Cloudy	90
24	88	73	T	N	154	18	Pt. Cloudy	60

1. *Aix sponsa*. WOOD DUCK.—Breeding abundantly in Horse-shoe Lake, a body of water in Cypress Swamp near Olive Branch. The young of the year greatly predominated over the adults. Of four specimens all were ♀ jv. They feed near the borders of the cypress in threes and fours, and were not wary.

2. *Ardea herodias*. GREAT BLUE HERON.—Common about Horse Shoe Lake, and few seen at Mound City.

3. **Butorides virescens.** GREEN HERON.—Common at Olive Branch, Mound City and Grand Chain. Called here "Injun Hen."
4. **Nycticorax nycticorax nævius.** BLACK-CROWNED NIGHT HERON.—One seen at Horse Shoe Lake.
5. **Helodromas solitarius.** SOLITARY SANDPIPER.—One seen at Horse Shoe Lake.
6. **Actitis macularia.** SPOTTED SANDPIPER.—Two seen at Mound City.
7. **Oxyechus vociferus.** KILLDEER.—Two seen at Olive Branch.
8. **Colinus virginianus.** BOBWHITE.—Abundant at Olive Branch, where young varying from the size of an English Sparrow up to the size of adults were seen. The birds were frequently met in flocks of ten to fifteen. Bobwhites were common at the other places visited.
9. **Zenaidura macroura.** MOURNING DOVE.—Abundant in all places visited.
10. **Cathartes aura.** TURKEY VULTURE.—Common everywhere in this region.
11. **Accipiter cooperi.** COOPER'S HAWK.—One seen at Olive Branch.
12. **Buteo borealis.** RED-TAILED HAWK?—Several large hawks that could not be positively identified were referred to this species.
13. **Buteo lineatus.** RED-SHOULDERED HAWK.—A young bird shot at Grand Chain.
14. **Falco sparverius.** SPARROW HAWK.—One or two seen at each place visited.
15. **Syrnium varium.** BARRED OWL.—Abundant about Horse Shoe Lake. Frequently flushed in day time and all night its *who-whoo-too whoo-whoo* would come booming out of the Cypress Swamp.
16. **Coccyzus americanus.** YELLOW-BILLED CUCKOO.—One taken. Cuckoos were frequently seen and heard, and possibly some of them were the Black-billed Cuckoo.
17. **Ceryle alcyon.** BELTED KINGFISHER.—Tolerably common at Horse Shoe Lake. One seen at Mound City.
18. **Dryobates villosus.** HAIRY WOODPECKER.—Tolerably common throughout the locality. Three specimens taken in August and one in February are intermediate between *villosus* and *v. auduboni*. They are nearer *auduboni* in size but in coloration they favor *villosus*.
19. **Dryobates pubescens medianus.** NORTHERN DOWNY WOODPECKER.—Abundant everywhere. Specimens taken in summer and winter are decidedly nearer *p. medianus* than *p. pubescens*, though they average smaller than northern Illinois birds. The average length (in millimeters) of wing of specimens from three different localities is given here: Florida and Louisiana, 87; Southern Illinois, 91; Northern Illinois and Connecticut, 92.
20. **Ceophloeus pileatus abieticola.** NORTHERN PILEATED WOODPECKER.—One seen at Olive Branch. Local hunters report these birds tolerably common in southern Illinois. They are extremely wary.

21. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.—Common.
22. **Centurus carolinus.** RED-BELLIED WOODPECKER.—Abundant at Olive Branch. Common elsewhere. They were feeding on choke-cherries.
23. **Colaptes auratus luteus.** NORTHERN FLICKER.—Tolerably common.
24. **Chætura pelagica.** CHIMNEY SWIFT.—Common.
25. **Trochilus colubris.** RUBY-THROATED HUMMINGBIRD.—Profusely abundant at Olive Branch and common elsewhere.
26. **Tyrannus tyrannus.** KINGBIRD.—Common.
27. **Myiarchus crinitus.** GREAT-CRESTED FLYCATCHER.—Common.
28. **Sayornis phœbe.** PHœBE.—Tolerably common at Olive Branch.
29. **Contopus virens.** WOOD PEWEE.—Abundant.
30. **Empidonax** sp. A little flycatcher of unknown identity was tolerably common at Olive Branch.
31. **Cyanocitta cristata.** BLUE JAY.—Rare at Olive Branch; common elsewhere.
32. **Corvus brachyrhynchos.** AMERICAN CROW.—Abundant.
33. **Agelaius phoeniceus.** RED-WINGED BLACKBIRD.—Abundant at Olive Branch. The females and immature birds outnumbered the full-plumaged males about 15 to 1. Common at Mound City and Grand Chain.
34. **Sturnella magna.** MEADOWLARK.—Common at Olive Branch and Grand Chain. In the former place they spend the heat of the day in the dense fields of hog-weed which grows up to a man's shoulders.
35. **Icterus spurius.** ORCHARD ORIOLE.—Two seen at Olive Branch.
36. **Icterus galbula.** BALTIMORE ORIOLE.—Tolerably common at Mound City; one seen at Grand Chain.
37. **Quiscalus quiscula æneus.** BRONZED GRACKLE.—Common at Olive Branch and Mound City.
38. **Astragalinus tristis.** AMERICAN GOLDFINCH.—Common.
39. **Coturniculus sandwichensis passerinus.** GRASSHOPPER SPARROW.—One male in worn plumage taken at Olive Branch.
40. **Spizella pusilla.** FIELD SPARROW.—Profusely abundant.
41. **Pipilo erythrophthalmus.** TOWHEE.—One seen at Olive Branch and Grand Chain.
42. **Cardinalis cardinalis.** CARDINAL.—Abundant.
43. **Cyanospiza cyanea.** INDIGO BUNTING.—Profusely abundant. Moulting.
44. **Spiza americana.** DICKCISSEL.—Common at Mound City.
45. **Piranga erythromelas.** SCARLET TANAGER.—One taken at Mound City.
46. **Progne subis.** PURPLE MARTIN.—Common.
47. **Petrochelidon lunifrons.** CLIFF SWALLOW.—Common at Olive Branch and Grand Chain.
48. **Riparia riparia.** BANK SWALLOW.—Common at Olive Branch and Mound City.

49. **Lanius ludovicianus migrans.** MIGRANT SHRIKE.—Several Shrikes seen at Mound City and Olive Branch are tentatively referred to this species.

60. **Vireo olivaceus.** RED-EYED VIREO.—Common. Moulting and mostly immature birds.

61. **Vireo noveboracensis.** WHITE-EYED VIREO.—The most characteristic bird of the thickets bordering the woods. It has a very pleasing and unique song. It is a rolling trill, with a flute-like quality. While listening to the song I wrote it thus: *Twe-wa-ra, ra-re-ra.*

62. **Mniotilla varia.** BLACK AND WHITE WARBLER.—Common. Both adult and immature birds taken. They were found in deep woods.

63. **Protonotaria citrea.** PROTHONOTARY WARBLER.—Abundant. All young birds had the fully adult plumage.

64. **Compsothlypis americana ramalinae.** WESTERN PARULA WARBLER.—These birds were tolerably common at Mound City. They kept to the tree tops in the river bottoms and in company with Cerulean Warblers. Three specimens, including immature as well as a fully plumaged adult, are typical of this subspecies. I believe that a considerable portion of the small flitting forms high up in the trees were of this species. Several times the faint, insect-like trill *za-za-za, zee-zee* of this bird was heard.

65. **Dendroica aestiva.** YELLOW WARBLER.—Two young birds seen at Olive Branch on the 11th.

66. **Dendroica cærulea.** CERULEAN WARBLER.—One taken at Olive Branch in dense timber. It was abundant in the cottonwood and willow bottoms along the Ohio at Mound City. Small bands of them were found flitting about the tree tops, betraying their presence with their faint lisping notes, or by occasional snatches of their song. The latter may be represented thus: *whee-la-te, zee-ee-e-e-e-e.*

67. **Seiurus motacilla.** LOUISIANA WATER-THRUSH.—Two seen at Olive Branch. One taken.

68. **Oporornis formosa.** KENTUCKY WARBLER.—One taken at Olive Branch, 3 at Mound City. Two were taken at one shot at the latter place. The adult was feeding the immature bird, though the offspring was as large as the parent.

69. **Geothlypis trichas brachidactyla.** NORTHERN YELLOW-THROAT.—These birds were everywhere profusely abundant and their sharp 'chip,' sounded from nearly every thicket and weed patch. Very few adult males were seen and most of the birds taken were moulting.

70. **Icteria virens.** YELLOW-BREASTED CHAT.—These shy birds were tolerably common at Olive Branch and 3 were seen at Mound City. They inhabited the densest thickets.

71. **Wilsonia mitrata.** HOODED WARBLER.—One taken along Cache Creek, near Mound City.

72. **Setophaga ruticilla.** REDSTART.—Tolerably common. Only 3 adult males were seen, the rest were immature or females.

73. **Mimus polyglottos.** MOCKINGBIRD.—Abundant at Grand Chain, but inexplicably absent from other localities visited.

74. *Galeoscoptes carolinensis*. CATBIRD.—Tolerably common; moulting.

75. *Thryothorus ludovicianus*. CAROLINA WREN.—Abundant. In song.

76. *Certhia familiaris americana*. BROWN CREEPER.—A single specimen of this bird was seen at Olive Branch on Aug. 11 creeping along trunks of cypress and tupelo trees.

78. *Sitta carolinensis*. WHITE-BELLIED NUTHATCH.—Common.

79. *Baeolophus bicolor*. TUFTED TITMOUSE.—Abundant. Many young and moulting birds seen.

80. *Penthestes carolinensis*. CAROLINA CHICKADEE.—Abundant in small bands.

81. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER.—Tolerably common. Young birds predominated.

82. *Hylocichla mustelina*. WOOD THRUSH.—Common. Singing at Olive Branch.

83. *Sialia sialis*. BLUEBIRD.—Tolerably common.

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#### GENERAL NOTES.

**The Kittiwake and Purple Sandpiper again in Maine in Summer.**—In 'The Auk' for July, 1907 (Vol. XXIV, p. 337) the capture of a Kittiwake in 1903 on the coast of Maine in summer was recorded. On July 14, 1907, while at Jordans Rock, a submerged ledge one mile S. E. by E. of Portland Head Light, a Kittiwake (*Rissa tridactyla*) flew over my boat within easy range. The small size of the bird, white head, and short black legs and feet were distinctly and critically observed as it passed over. It flew toward Grundys Reef until it disappeared.

In the 'Journal of the Maine Ornithological Society,' Vol. VI, p. 16, the capture of a specimen of the Purple Sandpiper (*Arquatella maritima*) at Metinic, Me., on August 11, 1902, was recorded. On August 6, 1907, while on Metinic Green Island, I saw another specimen of this bird. It stood on a large rock (behind which the greater part of my body must have been concealed from it), within three yards of me. I observed it critically, then tried to catch it; it flew readily, but showed the flight feathers to be faded and worn, and nearly ready to be moulted. Its tame ness was in part due, I believe, to the drenching rain which was falling.—ARTHUR H. NORTON, *Portland, Me.*

**That Cinnamon Teal Record from Florida.**—Unfortunately for Mr. William Brewster's theory of no reliable records for this species from the Southeastern States, my former note in 'The Auk' of a specimen from

Lake Iamonia, Florida, is indisputable. The specimen is an adult male in nuptial plumage and is now in the Museum of the Academy of Natural Sciences, Philadelphia. The gentleman who shot the bird and the taxidermist who mounted it in Philadelphia are known to us here. I examined it freshly skinned.—S. N. RHOADS, *Haddonfield, N. J.*

**The Snowy Heron in Camden County, N. J.**—On July 16, 1904, I saw a fine adult Snowy Heron (*Egretta candidissima*) near Delair, Camden County, N. J., feeding with an immature Black-crowned Night Heron on the Pea Shore Flats of the Delaware River. It allowed us to approach quite close in our boat and reluctantly took wing as we rowed in closer and closer, preceded by the more wary Squawks, and both birds flew into a small grove of trees on the shore.

This is the first authentic record of the occurrence of the Snowy Heron in the Delaware Valley in recent years, and as the bird was well seen at a distance of less than fifty feet there can be no doubt as to the correctness of my identification. I am positive of it, and would inform the incredulous, who may be inclined to think that the bird I saw was an immature Little Blue Heron (*Florida carulea*), that I am well acquainted with the distinguishing marks of the two species and recognized the bird at once as the Snowy Heron. Furthermore, I have been hunting for this bird for several years, but only to run across one without a firearm of any sort. Hard luck, truly, but this seems to be a frequent misfortune of mine, possibly because I am not of a collector of skins and seldom carry a gun, for I have on several occasions stumbled upon rare birds and wished in vain for a gun.

A few words regarding the status of the Snowy Heron in the Delaware Valley will not be amiss in this connection. In Stone's 'Birds of Eastern Pennsylvania and New Jersey' it is given as a "straggler from the South" (page 63); and yet Chapman, in his 'Handbook,' says it breeds as far north as Long Island. This is a rather singular statement in these days, although it may have bred there formerly. However, now it is a rare transient everywhere north of 39° north latitude at least.

Evans in his excellent paper on 'The Unusual Flight of White Herons in 1902' (see 'Cassinia' for 1902, page 15) does not mention a capture or a record of the Snowy Heron, nor are there any subsequent records. The Snowy Heron, then, can rightly be regarded as a "rare straggler" in the Delaware Valley, at least.—RICHARD F. MILLER, *Harrowgate, Philadelphia, Pa.*

**American Coot (*Fulica americana*) Nesting near Newark, New Jersey.**—In 'The Auk,' XXIV, pp. 1-11, I recorded the nesting of the Pied-billed Grebe (*Podilymbus podiceps*) and the Florida Gallinule (*Gallinula galeata*) in the marshes near Newark, N. J.; also, the presence in the same marshes of the American Coot, although no nest of this species was discovered. On May 30, 1907, I visited the same marsh area in company with Messrs. J. P. Callender, P. B. Philipp, R. H. Southard, and T. F. Wilcox—all

members of the Linnaean Society of New York. I am pleased to record that a nest of the American Coot containing eight eggs was discovered by Mr. Wilcox, thus establishing this bird as a nesting species within seven miles of New York City Hall.

In other respects conditions in the marsh-bird colony were found to be much the same this year as those described in the above mentioned article.—CLINTON G. ABBOTT, *New York City*.

**The Stilt Sandpiper in Massachusetts.**—While looking over the 'General Notes,' in the July issue of 'The Auk' I noticed a reference to the Stilt Sandpiper (*Micropalama himantopus*) in Massachusetts. I think the rarity of this species in this State has been greatly exaggerated in this note.

On September 20, 1903, while gunning at Chatham with a friend, a flock of about a dozen Stilt Sandpipers flew over us, and we each secured a pair. Since then both my brother and myself have seen numbers of these birds in the big market in Boston, which were shot along the south shore in the vicinity of Chatham and Monomoy.

Thus it seems to me that the Stilt Sandpiper is not so rare in Massachusetts as Mr. Nash believes and states it to be. I would like to hear from other Massachusetts men in regard to the prevalence of the Stilt Sandpiper in this State.—WINTHROP S. BROOKS, *Milton, Mass.*

**The Buff-breasted Sandpiper (*Tryngites subruficollis*) on Long Island, N. Y.**—Owing to the infrequent occurrence of this species on the Atlantic coast, I wish to record a young male in my collection taken at Rockaway Beach on Sept. 11, 1906.—J. A. WEBER, *New York City*.

**American Goshawk (*Accipiter atricapillus*) versus Man and Barred Owl.**—Two incidents, illustrating at once the ferocity and the "lack of judgment," so to say, of the Goshawk, have lately come to the writer's notice. About May 15, 1905, Mr. Ferdinand Lack, a farmer of Germanicus, Renfrew County, Ontario, had occasion to go into an old, little visited pasture on his farm, lying along an extensive piece of woods. Suddenly a large hawk swooped down upon him, flew around his head in most threatening and uncomfortable proximity, at the same time striking at him with wings and claws, as if it wanted to arrest his progress. In this the hawk was successful, the man could not proceed. The next day the farmer wanted to resume his interrupted inspection of the pasture, and thinking that the experience of the day before would probably remain unique, took no weapon of any kind along. But the same thing happened again. He had to turn back again, as he could hardly dodge the vicious onslaughts of the bird. The inspection of the meadow had to remain incomplete again. Once more the farmer sallied forth the following day, but this time in the company of his gun. But even the sight of this did not deter the bird from making his usual assault with the result, of course, that it was speedily put out of commission by a shot from the farmer's gun. He

gave the fine hawk to a friend of the writer, who has taxidermic propensities, when it was identified as the Goshawk. This bird probably had its nest in the woods along the pasture.

A more remarkable instance came to the writer's notice at High Falls, Wright County, Quebec, fifty miles northeast of Ottawa. There, one morning last February, Mr. Hugo Paeseler, a farmer, on going out into the woods adjoining his farm, noticed a space of about ten to fifteen feet square, where the snow had recently been much disturbed, deeply plowed up from some great commotion. That a fierce fight had been going on but a short while before was evident from the liberal quantities of blood sprinkled on the snow and the masses of feathers, single and in whole bunches, lying about and adhering to bushes and trees. On looking around for the principals of the fight, he found about ten feet away in one direction a Goshawk, lying on the snow with wings extended and frozen stiff. About ten feet away from the scene of hostilities, in the opposite direction, he found an owl, more damaged than the hawk, but still warm. It had alighted after the fight on a small spruce and fallen off, as the snow showed, and with its last strength crawled into a small log, lying with its hollow part conveniently near. The farmer took both along home, skinned and "stuffed"—here that term is appropriate—the hawk, and also the head of the owl, which was all he could make use of in her case. When the writer saw them at the farm house, they turned out to be the Barred Owl and the American Goshawk. It must surely have been a battle royal, if one could only have witnessed it. The farmer, quite a shrewd observer, tells me, that the same hawks are there winter and summer, which is, of course, not to be wondered at, the place being right in the Goshawk range. The writer's theory is, that the Goshawk, hungry and ill at ease from the severe cold, while looking for its breakfast, encountered the owl, then peacefully returning from its nightly foraging. In its usual injudiciousness, courage, fierceness, or whatever one may call it, he pounced down upon the owl, which, however, had no desire to be made a meal of, and defended herself so valiantly, that both had no more use for breakfasts.—

G. EIFRIG, Ottawa, Ontario.

**Unusual Occurrence of the Short-eared Owl in Pennsylvania.**—The Short-eared Owl (*Asio accipitrinus*), is a rather frequent migrant and winter resident in this section, occurring in small flocks wherever there is a sufficient abundance of *Microtus*. Here they remain until about the first of April, when they usually wend their way further north. This year, however, was an exception, at least with one pair which I had the fortune to observe.

The first evidence of mating was noticed on March 28, when they were noted sailing about in the dusk, occasionally giving vent to a peculiar call—*whaq*, with a nasal intonation. They were frequently heard during the first ten days of April but no more were seen until April 19, when in crossing a weedy field I flushed a fine specimen and observed it sailing about for some time.

No more was seen of the owls and I had almost forgotten them when about six p. m. on the night of May 28 I was astonished to observe one fly close by our residence, uttering its peculiar call. The next morning I tramped over several miles of suitable fields but could not flush any and none have been observed since.

The bird is so rare about Philadelphia after April 15 that this record seems to demand attention.— RICHARD C. HARLOW, *Edge Hill, Pa.*

**The Breeding of the Short-eared Owl (*Asio accipitrinus*) near Ann Arbor, Michigan.**— The Short-eared Owl is a common migrant in this locality, but although a hunter once told me of finding a nest here I have had no positive proof that it breeds in this vicinity until this summer. On June 26, 1907, there was brought to me three immature specimens of this species, which had been taken in a grassy marsh seven miles south of Ann Arbor. On these birds the down was still present in places, and the wing and tail feathers were only partly out of the sheaths so that only short flights could be made. The collector did not look for the nest, which was no doubt near by. The skin of one of these birds is preserved in the University Museum.— NORMAN A. WOOD, *University Museum, University of Michigan.*

**Mortality among Kingfishers.**— While digging out some Kingfishers' nests this season I was surprised to find a dead bird in about every fourth or fifth hole. This I was at loss to account for, as the birds showed no signs of combat or disease, while the plumage was not even disarranged. The bodies, though, seemed to be dried up, with no signs of blood in them, so I presumed that something had crawled into the holes and sucked the blood from them, leaving the carcass intact. This surmise proved correct, as the last hole I dug out contained a large black snake, and a dead kingfisher still warm. The snake measured about four and a half feet long and had evidently gone in for the eggs, any kind of eggs being readily devoured by this snake in this section. The holes were generally from two to three feet below the top of the bank, so it was an easy matter for them to get down from the top. I found no less than six dead birds within a mile, and if all of the river bank gave the same average, the loss of life must have been great. I am at loss, however, to account for their molesting the kingfishers and not the Rough-winged Swallows, which also nested abundantly in the same bank. Snakes are more numerous this year than ever before.— H. H. BAILEY, *Newport News, Va.*

**The American Crossbill in Camden County, Ga.**— On November 12, 1906, I noticed American Crossbills (*Loxia curvirostra minor*) here (Camden County) for the first time. While riding through a pine forest with hard-wood underbrush I flushed 15 or 20 from a small open pond where I presume they were getting water. They flew to the tops of the tall pines,

and I watched them for some time feeding on the pine cones. Never having seen the bird in life before, I had some trouble in making out what they were, but at last decided that they were Crossbills. After that I often saw them, and in fact they became quite common, and remained here until the middle of May. I only killed one (an old male) and now have the skin in my collection. Whenever seen they were invariably in the pine trees and never still long at a time.—I. F. ARNOW, *St. Marys, Ga.*

**Nesting of Crossbills in Colorado.**—The paper by Rev. P. B. Peabody in the July number of 'The Auk,' on the nesting of the Bendire Crossbill in Wyoming led me to look through the notes of Denis Gale, who spent the years from 1883 to 1893 inclusive in the mountains of Boulder County closely observing our mountain birds. These notes are now owned by the University of Colorado, and have been transcribed, annotated and indexed for convenient reference, forming 278 pages, exclusive of index. I find few references to Crossbills, and only in 1893 are there definite notes of their nesting habits, though under date May 21, 1890, he does say that he saw that day a family of these birds with "young fully grown nearly." All of his references are to the American Crossbill, but doubtless those he saw were *Loxia curvirostra bendirei*, a subspecies likely unknown to him. He was well along in years at that time, and had learned his ornithology at a much earlier period. I extract the following from his notes:

"March 28, [1893] 172 [= Smithsonian Check List No., Bull. 21, U. S. Nat. Mus., 1881]. In this locality saw crossbills to all appearances looking for exact site or having already begun to build, but not in earnest, as I watched them a long time without results."

"March 31. 172. The pair of crossbills noted on the 28th inst. were evidently resting from their labors, having completed their nest building. Now I come to think of it their demeanor said as much. I regret not witnessing the building operation which I believe was wholly undertaken by the female. Locality, a sheltered hillside east of Buckhorn Mountain, on north side of clump of scattered coniferous trees, in pine tree about 18 feet from the ground, saddled on horizontal branch 5 feet from main stem and 4 feet from end of branch, the nest shielded on the weather side by part of another branch from below, and yet immediately underneath the nest could be easily seen, although the site would be easily overlooked, if indeed it would be examined at all, it being in a general way the least likely tree to be selected for nesting, a number of others more sheltered and offering better hiding being at hand. Upon approaching the belt of scattered timber I stood several minutes looking to the center of further edge to see if I could discover the bird carrying building material, in which direction I had supposed the nest site selected from the manner of the birds I had previously watched, instead of which I was within a few feet of the tree the nest was located in. The male suddenly lit upon the top of a tree. At a greater distance no doubt he had seen my intrusion and become alarmed. I saw at once by his anxious manner that he was to be watched,

so I stood still, keeping him in view. In two minutes he flew a little quartering toward me to another tree top, and in less than half a minute flew toward the nest site and when within two feet of it the female joined him and flew off. The apparition of the female led me to examine the location of her exit from the tree, when I plainly saw the nest. Intending to watch matters I walked off 20 or 25 yards and sat down. Upon doing so I saw the male on a twig close to the nest. I did not see the female at all, whom he must have conducted back to the nest. His stay there was momentary. I only had time as I turned around to get a glimpse of him as he flew away. Still of opinion that they were building or completing their nest I waited and watched for nearly two hours and went away intending to return. Upon my return, as before I went away, I struck the tree trunk and some of its lower branches, but the female did not flush. I climbed the tree and discovered the female sitting close. I reached out and rudely shook a spray with two or three pine tassels on it which were immediately over the nest, to no purpose. She trembled but would not fly off until I poked her with my finger. She was covering two eggs. After leaving the nest I watched. It was fully ten minutes from one tree top before she crossed the site to another tree and after two minutes more she again settled on the nest. I did not see the male anywhere about except for an instant, after his unnecessary anxiety gave his mate away. While building the nest I believe, as with some other birds, this species' nest can be located, and in no other way unless given away by the male. Accident brought the male to the nest locality just as I happened to be near the spot, otherwise it was 100 chances to one I had not discovered it."

"April 3. 172. Took nest and 3 eggs to-day. Watched the male feeding female at long intervals, 1½ to 2 hours. He seemed to fly some distance away. Was not present when the nest and eggs were taken. Eggs were covered from the first laying, to prevent their being chilled I presume. The male seemed very devoted to his mate and likewise the female to her nest and eggs. Measurements of nest as follows: 5 in. wide, 2½ in. deep, outside; 1½ in. deep, 2½ in. wide, inside. Dimensions taken on the spot, therefore correct. Composition of nest: Foundation a few twigs, with stiff, strong plant stems, some of the latter stayed through the body or wall in which is felted a few fine grass stems, with much plant fiber, species of wild hemp [?], the same somewhat finer with a few feathers felted in for inside lining, which feels a little harsh. The structure is light but well knit together; warm, without being very dense. Should think it took at least a week to construct. Saddled upon bough 1½ inches thick, well protected by laterals. Eggs slightly incubated. No additional eggs intended. Measurements of eggs: .69 + .44, .70 + .44, .72 + .54 in. ...."

"May 8. 172. At Fred Ehler's and on hillside, Zieman's Gulch, saw young and old birds together feeding on pine seeds, the old birds searching the pine cones."

Although Mr. Gale spent most of his time in the field during the nesting

season these are the only definite notes connected with the nesting of the crossbills in all the 278 pages. I may add that although I spend a little time in the coniferous forests of our mountains up to timber line each year I have never seen any crossbills. Dr. Ridgway, in Part 1 of his new work on 'Birds of North and Middle America,' notes several breeding records of *L. c. bendirei*, published under the names *L. c. americana* and *L. c. mexicana*.—JUNIUS HENDERSON, *Boulder, Col.*

**Occurrence of a White-winged Crossbill at Oxen Hill, Md., in August.**—On August 13, 1907, Mr. Ernest Kletsch, of the Department of Agriculture, brought me a White-winged Crossbill (*Loxia leucoptera*) that had been accidentally killed the day previous at Oxen Hill, Maryland, about four or five miles southeast of Washington, D. C. Taken in connection with the record (mentioned elsewhere in these notes by Nelson R. Wood) of a White-throated Sparrow in the grounds of the Smithsonian Institution at about the same time, this occurrence of a northern bird in midsummer in the vicinity of Washington suggested a possibility of special significance, but no further unusual records have come to my attention and I merely mention the incident as a curious instance of irregularity. It would be of interest to know if similar observations were made elsewhere.—HENRY OLDYS, *Washington, D. C.*

**The Vesper Sparrow (*Poaccetes gramineus*) on Long Island, N. Y., in Winter.**—In order to confirm Mr. J. T. Nichols's observation published in 'The Auk,' Vol. XXIV, p. 220, I wish to record four specimens in my collection taken on Feb. 7, 1905, near the northern part of Jamaica Bay, from a flock of these birds found roaming the snow covered fields.—J. A. WEBER, *New York City.*

**A White-throated Sparrow in Washington, D. C., in August.**—On the morning of August 9 a White-throated Sparrow (*Zonotrichia albicollis*) flew down into the grass near where I was sitting and remained in plain view for some time, about fifteen feet from me. It was in moult, as a part of its tail was gone. Wishing other witness to this, I asked Mr. William Palmer to visit the spot. He, too, saw it. The next morning found me, with field glass in hand, again at the place, and to my joy the bird was still there. I called Mr. Oldys, who was passing, and handed him the glass. He also saw and identified the bird. Is it not unusual for this bird to be here in this season, and does it not point to the fact that birds migrate when in moult?—NELSON R. WOOD, *Washington, D. C.*

**Nesting of the Rose-breasted Grosbeak in Philadelphia County, Pa.**—The Rose-breasted Grosbeak (*Zamelodia ludoviciana*) was formerly regarded as a migrant of transient occurrence in the Lower Delaware Valley (see Stone's 'Birds of Eastern Pennsylvania and New Jersey,' page 6), and not until late years was it found to be a summer resident of the Carolinian

fauna, as it was considered a characteristic bird of the Alleghanian and Canadian faunas, particularly of the former zone.

The first nest, I believe, to be recorded from the Carolinian fauna was discovered by Mr. J. Harris Reed at Beverly, Burlington County, N. J., (see Auk, 1897, p. 323), and the second was found by G. H. Moore at Haddonfield, Camden County, N. J. This nest and eggs was acquired by the Delaware Valley Ornithological Club of this city for its matchless collection, and its discovery was reported at the February 2, 1899, meeting of the Club.

Reed has also found the Rose-breasted Grosbeak nesting in Upper Makefield township in Bucks County, Pa., and I have found it to be a summer resident in Bensalem township in the same county, in the vicinity of Cornwell's Station, where, also the Scarlet Tanager breeds. And further investigation would no doubt reveal the bird as a breeder at other localities in the Carolinian fauna, as it appears to be becoming a regular resident in various parts of this zone.

On May 28, 1907, I found a nest of the Rose-breasted Grosbeak at Torresdale, Philadelphia County, Pa., which is the only record of a nest for this county, and the most southern record for Pennsylvania which I have been able to find.

Until I found my nest Reed held the next record for southern nesting of the Rose-breast, but his record must now be accorded third place, as the nest I found is several miles further south.

The nest I found was collected with two fresh eggs. It was situated 6 feet up in a many-forked elder bush, in a thicket of elder, alder and spice bushes along the Poquessing Creek, bordering a wood of deciduous trees.

If there are any other records of the nesting of the Rose-breasted Grosbeak in the Carolinian fauna I should be glad to hear of them.—RICHARD F. MILLER, Philadelphia, Pa.

**An Intergrade between *Helminthophila pinus* and *H. leucobronchialis* captured in Hyde Park, Mass.**—This bird, a male, was discovered by me on the morning of June 13, 1907, on a hillside covered by a dense growth of low oaks and birches, in the town of Hyde Park, Mass. I was drawn to the bird by his song, which was identical with that of the Golden-winged Warbler, being sometimes composed of three notes, *zee, zee, zee*, sometimes of four, and once only of two. I thought likely that it might be breeding here, but I could find no trace of the nest, so I decided to return in the afternoon and shoot the bird if it could be found, in order that a proper examination and record of it might be made.

I returned about three o'clock and shot it near the place where I had seen it in the morning. The description and measurements of this specimen are as follows:

Crown yellow, with a few dark feathers. Back and wings greenish yellow, some of the wing feathers being bluish gray edged with greenish. Tail bluish gray above, the three outer pairs of feathers partly white.

Both wings and tail light gray underneath. Two yellow bars on each wing, not so broad as in *H. chrysoptera*. A black line through the eye; sides of neck a little whitish; chin, throat, breast, sides, and belly decidedly yellow, this color being strongest on the breast. Some bluish gray feathers on the upper back and wings. Eyes hazel. Bill black. Tarsi and feet greenish black. Length, 5.05 in.; extent, 7.75; wing, 2.40; tail, 1.90; tarsus, .75; middle toe, .50; bill, .40. This specimen is now in my collection.—H. G. HIGBEE, *Hyde Park, Mass.*

**Additional Notes on the Brewster's Warbler in the Arnold Arboretum, Jamaica Plain, Mass.**<sup>1</sup>—The five eggs hatched June 15; the young left the nest June 22, after remaining in the nest but seven days. This tallies exactly with what I observed in a nest of *Helminthophila chrysoptera* in Arlington, Mass., in 1897: the five eggs hatched June 8, the young quit the nest June 15.

An agent was sent from the Museum of Comparative Zoölogy on the 22d to collect the young birds and the two parents, but he was forbidden by the authorities of the Arboretum to shoot any of them. The nest is now in the Museum (No. 5083). The parent birds in this case were, as far as I could see, a normal male *H. leucobronchialis* without any yellow below, and a female *H. chrysoptera* (essentially), the only abnormal mark that I could detect on her being a blackish line bounding the gray cheek patches above and separating them from the white superciliary streaks. The five eggs, it may be noted, were dark-spotted near the larger end and appeared like those of *H. chrysoptera*.—WALTER FAXON, *Lexington, Mass.*

***Helminthophila leucobronchialis* (Brewst.) in Lexington, Mass.**—On the 14th of June, 1907, while walking in company with Dr. Winsor M. Tyler through a hillside pasture sloping down to a wooded swamp in the town of Lexington, Mass., I came upon a male Brewster's Warbler in full song. This bird was often scrutinized by Dr. Tyler and myself at short range and with the aid of powerful glasses, from this time forth up to the end of June, about which time it stopped singing and disappeared from view. It wore the pure, unadulterated *leucobronchialis* dress, revealing not the slightest trace of yellow on the lower parts, even when seen at close quarters and by the aid of the most favorable light. Its crown was bright yellow, lores black, this color continued behind the eye as a short, thin postocular streak (as in *H. pinus*). Back gray (as in *H. chrysoptera*). Wing-patch yellow, indistinctly divided into two bars. Lower parts silk-white, purest on the chin and throat.

There were two male *H. chrysoptera* in the immediate neighborhood—so near that all three could be heard singing at the same time. The Brewster's Warbler had two different songs, absolutely indistinguishable from two of the songs of the Golden-winged Warbler. The first of these

<sup>1</sup> See Note by Helen Granger, in the July number of 'The Auk,' p. 343.

was the familiar *zee, zee, zee, zee* of *chrysoptera* varied at times by docking one or two of the last notes. The second song may be represented thus:—*ti-ti-ti-ti-ti-ti*, *zee*, the preliminary notes (sometimes increased to as many as eight) delivered rapidly and without any of the buzzing quality of the long, higher, final note. This song also was indistinguishable from the second song of the Golden-winged Warbler.

Let us now compare the song of this bird with what has hitherto been recorded concerning the song of Brewster's Warbler. The type specimen (Newtonville, Mass.) was singing the first song of *chrysoptera* when it was shot (*test*, Brewster and Maynard). The Arnold Arboretum bird recorded by Miss Granger in the last number of 'The Auk,' usually sang the same song (*zee, zee, zee, zee*) but on one occasion it was heard singing the second song, described above, several times in quick succession (Miss Granger, *in litt.*). The intergrade between *H. pinus* and *H. leucobronchialis* shot by Mr. Higbee in Hyde Park, Mass., on June 13 of this year (see Mr. Higbee's note above) sang the first, ordinary song of *chrysoptera*. In brief, the few observations on the song of Brewster's Warbler in Massachusetts disclose no differences between it and the Golden-wing. Connecticut observers, on the contrary, find that in that State Brewster's Warbler sings sometimes like *chrysoptera*, sometimes like *pinus*, while Mr. Eames (Auk, VI, 309) and Mr. Sage (Auk, X, 209) aver that at times it utters notes peculiar to itself. But are Mr. Eames and Mr. Sage familiar with the second, less often heard song of *chrysoptera*? If not, the "peculiar" notes may prove to be those of the Golden-wing.

In this connection it may be worth while to complete the account of the musical repertory of *H. chrysoptera*. One bird, observed last June, varied his score by combining the first and second songs into one long and varied melody,—*zee, zee, zee, zee, ti-ti-ti-ti-ti-zee*; another, discovered by Dr. Tyler near the Lexington Golf Links, sang in addition to songs 1 and 2, a third peculiar song, two long-drawn notes, *zee, zee-e-e-e*, the second note higher than the first and delivered with a quaver. This song No. 3 singularly suggested the ordinary song of *H. pinus*, though the relative pitch of the first and second notes was reversed.

On one occasion we heard the second song given when the bird was on the wing, and modified by that rapturous delivery which goes with the flight songs of birds. The author of this song was probably the Brewster's Warbler, though the proximity of two Golden-wings at the time made this a little uncertain.

It was my intention to secure the Brewster's Warbler at last, but I delayed shooting so long in the hope of finding through him his mate, nest, or young, that he eluded me by lapsing into silence.

This is the fourth specimen of Brewster's Warbler in Massachusetts. The other records are, Hudson, May or June, 1858, ♂, Sam'l Jillson, now in the collection of Williams College (Purdie, B. N. O. C., IV, 184); Newtonville, May 18, 1870, ♂, the type, W. Brewster (Amer. Sportsman, V, Oct. 17, 1874, p. 33); Jamaica Plain, May 19, 1907, ♂, Helen Granger

(Auk, XXIV, 343). Of these the type specimen (in Mr. Brewster's collection) has a very faint tinge of yellow on the breast, the others showed no trace of yellow on the lower parts. Then there is the specimen recorded in this number of 'The Auk,' Hyde Park, Mass., June 13, 1907, ♂, H. G. Higbee, which is midway between *H. pinus* and *H. leucobronchialis*, heavily washed with yellow from the base of the bill to the under tail coverts.—  
WALTER FAXON, Lexington, Mass.

**A Correction.**—In Mr. Ridgway's 'Birds of North and Middle America,' Part II, 1902, p. 572, the citation "Dendroica cærulea Loomis, Auk, VIII, 1891, 170 (Chester Co., South Carolina, Apr. 15 to May 3 and Oct. 4 to 26)" should be cancelled and transferred to the Cape May Warbler (*Dendroica tigrina*). The correct citation for *Dendroica cærulea* is "Loomis, Auk, VIII, 1891, 170 (Chester Co., South Carolina, April 13 to 30, and Aug. 8 to Oct. 22)." — ARTHUR T. WAYNE, Mount Pleasant, S. C.

**The Northern Water-Thrush again Nesting in Massachusetts.**—In 1905 I recorded in 'The Auk' the nesting of the Northern Water Thrush (*Seiurus noveboracensis*) in Lancaster, Mass. I found two sets of eggs, May 21, 1905, well incubated.

This year, June 23, 1907, not in the same swamp, but near it, I found a brood of young of this species that could fly. I shot one. It would seem to establish the fact that this bird breeds regularly in this locality.

The eggs must again have been laid early in May, despite the cold spring and the late arrival of the north-bound migrating Water-Thrushes.—  
JOHN E. THAYER, Lancaster, Mass.

**A Mockingbird (*Mimus polyglottos*) in Lexington, Mass., in Winter and Summer.**—A Mockingbird appeared near my house in Lexington on the 8th of February, 1907, and was seen by me at intervals up to the 29th of March. On the 31st of March and the 4th of April a Mockingbird, doubtless the same one, was seen by several persons in another part of the town, about a mile to the eastward. He was neither seen nor heard again until the 9th and 10th of July, when he reappeared near my house. This bird sung at the end of March, early April, and on both the days when he was seen in July. He was an unusually fine singer, even for a Mockingbird. Among his very perfect imitations the notes of the Phœbe and Great Crested Flycatcher were conspicuous. The winter of 1906-07, it should be remembered, was an unusually cold one in eastern Massachusetts.—  
WALTER FAXON, Lexington, Mass.

**The Great Carolina Wren in Southern Rhode Island.**—As has been previously noted in 'The Auk' by the present writer, this bird has been within recent years known to summer in southern Rhode Island. Last year and year before (1905-1906) there was no indication of his presence in the neighborhood of Peace Dale in South Kingstown in the Narragansett

country of Rhode Island. This year, however, at least one male has been heard singing upon the 28th and 29th of June, and the 1st and 2d of July in precisely the same neighborhood where he was heard and seen, as previously recorded. The song this year was a rather faint-hearted imitation of the Cardinal's fine call. By that I mean, that it was not uttered with the boldness observed in previous years. This may have been due to the great heat or some other cause, but there is no question it is the voice of the Great Carolina Wren upon the dates given this year.

I send this note to 'The Auk,' hoping that some other observer may feel prompted to record his observation, as it is certainly a matter of interest to Rhode Islanders to find this delightful bird becoming a fairly regular summer visitor.—R. G. HAZARD, *Peacedale, R. I.*, *July 4, 1907.*

**Large Set of Brown-headed Nuthatch's Eggs.**—On March 17, 1907, I took a set of eggs that perhaps is worth mentioning. While out riding I saw a Brown-headed Nuthatch (*Sitta pusilla*) fly from a hole in a pine stump (about 6 feet up). Riding up to it I broke a piece of the wood away and peeped in. To my surprise, the nest contained nine eggs. I took the nest and eggs and now have them. Incubation was slight. The eggs are rather under the average in size and very uniformly marked. I have never seen a set of more than six eggs before and have found sets of that number rather rare. The usual set here is five eggs, while often it is four and sometimes only three. The earliest set I have ever taken was a set of six fresh eggs on March 3, while the latest was a set of five slightly incubated on April 22.—I. F. ARNOW, *St. Marys, Ga.*

**A Recent Blue-gray Gnatcatcher (*Polioptila carulea*) in Delaware Co., Pa.**—On May 18 while out birding near Wayne, Pa., I was surprised to see a Blue-gray Gnatcatcher above me. I was more than pleased to see it on account of its rareness in this locality and also the first one I had ever seen. I followed and watched it at close range with fairly strong glasses and feel very sure of its identity. The long black tail with white edges and the whole appearance of the bird were unmistakable.—LEONARD S. PEARSON, *Wayne, Pa.*

**Two Birds new for Ohio (*Oceanites oceanicus* and *Merula migratoria achrustera*).**—During a recent visit to New Bremen, Anglaize Co., Ohio, Mr. Gus Kuennen, a banker and close observer of birds, told me about the occurrence of Wilson's Petrel at this place. On July 7 of this year, he found the partly decomposed body of a bird, which had been washed off the roof of St. Paul's church by a severe rainstorm. He identified the bird and upon cross-examining him I found that he knew very well what he was talking about and that his identification was correct. How long the body had lain on the roof could not be told and it was also too far gone to be preserved. It was probably killed by striking against the church tower. This is the second species of these wanderers that has been found in the State of Ohio.

In going over my specimens of Ohio Robins I found a female shot April 20, 1900, at Waverly, Ohio, that agrees in coloration with the description of *Merula migratoria achrustera* as given in Vol. IV of Ridgway's 'Birds of North and Middle America.' The measurements are somewhat larger than the type measurements, but the bird certainly is much closer related to *achrustera* than to *migratoria* proper. I do not doubt but what the majority of the southern Ohio Robins belong to the southern variety, as even some of the wintering Robins shot there are not typical *migratoria*.—W. F. HENNINGER, *Tiffin, Ohio*.

**Petiver's 'Gazophylacium.'** — I recently found in an old book shop a unique copy of Petiver's 'Gazophylacium Naturæ et Artis,' consisting of 100 folio copper plates and 1245 figures of "beasts, birds, fishes, reptiles, insects, shells, plants, corals; as also diverse fossills, formed stones of the sea, with their names, places and short descriptions to each," London, 1702-1709.

With these two volumes of plates was originally published a small volume of text giving a short description of the original of each figure. This last volume seems to have become very scarce for in 1742, a Mr. Roger North of Rougham, after waiting upwards of twenty years, found a copy; then, for his amusement, he transcribed all the descriptions onto a sheet opposite each figure in the plates. Not satisfied with this he gathered five other of Petiver's productions, in all 195 folio plates, and 2726 figures, treating them in the same manner, thus producing 258 folio pages of finely written matter.

Aside from being unique the book is of especial interest to Americans as it contains 92 figures of American animals, birds, insects, etc. Perhaps the most interesting and probably the first cut ever published of the Ruby-throated Hummingbird (*Trochilus columbris* Linn.) is found on Plate 3, Fig. 8. It portrays the back view of a rather well shaped skin and the written description reads "Tomineo Mariana Virescens Guttare flammeo. The Humming Flame Throat. The Reverend Mr. Hugh Jones sent me this scarce and beautiful bird from Mary-Land."

On Plate 6 is figured the side view of a skin. In a general reference to all the figures on the plate I find: "Here you will see first a mondescript Bird from Mary-Land with a Golden or yellow throat"; then each figure is treated separately and the following occurs, 'Avis Marylandica Guttare Luteo. The Mary-Land yellow throat. This the Reverend Mr. Hugh Jones sent me from Mary-Land." Doubtless church records somewhere will show who this clergyman was who sent bird skins from the Jamestown Exposition region over two hundred years ago; 1696 to 1698 being the years most often mentioned in acknowledging specimens.

Another figure on Plate 43 represents the American Eared Grebe, opposite which he writes: "Ardea Exotica Aurita. This Bird is very remarkable For its two eared Tufts on the Head and Wanting its Back Toe. Mr. Ray's Figure of the *Ardea Cinerea minor* in his Ornithology Tab. 49, pag.

279 some what resembles it. I copied this from A picture in Mr. Clark's Collection of Paintings." Some of our modern bird skinners might get amusement, if not inspiration, from the methods in vogue over two hundred years ago, for in his "Directions for preserving All Animals, viz; Beasts, Birds, Fishes, Serpents, Insects, Shells, Fossils &c. so as to keep" he says: "Thirdly, as to Fowls, those that are large, if we cannot have their Cases whole, their Heads, Legs and Wings will be acceptable: but smaller birds are easily preserved entire, by Opening their Bodies which is best done by cutting them under the Wing, and take out their entrails, and then Shutt them with Oakham or Tow mixt with pitch or Tar and being thoroughly dried in the sun, wrap them up Close & keep them from moisture." I know nothing of Roger North who so laboriously transcribed these works but if he had a monument of marble it is not better preserved than this one of paper and nut-gall ink.—FRANK S. DAGGETT, *Oak Park, Ill.*

**Supplemental Note to 'A Lapland Longspur Tragedy.'**<sup>1</sup>—Mr. A. D. Brown of Pipestone, Pipestone Co., in replying to the letter of inquiry sent to him said that twice before in his experience in southwestern Minnesota, extending over a period of twenty-five years, there had been similar considerable destructions of Lapland Longspurs occurring in the spring of the year under like climatic conditions. One of these he describes in some detail as he observed it at Pipestone. A sleet had fallen which froze as it fell, covering the earth with a layer of ice on which three inches of soft wet snow fell. That night the migrating Longspurs entered this ice and snow covered area, many of them hungry and weary, and being unable to procure food finally fell from exhaustion and were either killed by injuries received in striking various objects or remained fluttering about on the ground until the sun rapidly melted the snow and ice the next morning, thus uncovering the fallen seed supply, from which they secured sufficient food to restore their strength and permit them to continue on their way. By afternoon all these birds were gone. Mr. Brown thinks this failure of the food supply the correct explanation of the phenomenon, because when the live birds were picked up that night they fed greedily from seeds provided and quickly gained sufficient strength to fly away. Also the stomachs of many dead birds examined were empty although the bodies were fat. During the early winter, when the Longspurs are abundant, the snow is dry and blows off the ridges and fields, and then, too, the weed tops projecting above the snow still contain many seeds which are later shaken out by the high winds. During the wet snowfalls of early spring, conditions are quite different and the ground-feeding seed-eaters occasionally find their food supply suddenly withdrawn over wide areas. There was no snow at Pipestone at the time of the last destruction and although the Longspurs were present in great numbers none perished at

<sup>1</sup> Published in this number of 'The Auk', pp. 369-377. This note was received from the author too late to be added as a footnote at the end of the article.—EDD.

that place. This theory of Mr. Brown's of rapid exhaustion from sudden withdrawal of food seems worthy of consideration and may seem, in part at least, to explain these rather mysterious occurrences.—THOMAS S. ROBERTS, *Minneapolis, Minn.*

#### RECENT LITERATURE.

**Ridgway's 'The Birds of North and Middle America,' Part IV.<sup>1</sup>**—Part IV of this great work, issued in July of the present year, marks the completion of the first half, carrying the subject through the Oscines and including the first four families of the Mesomyodi. The first four Parts contains, as stated in the Preface, "1,675 species and subspecies, or somewhat more than half the total number of North and Middle American Birds."<sup>2</sup>

The present volume includes ten families, as follows: Turdidae, with 12 genera, 54 species and 43 additional subspecies; Zeledoniidae, monotypic (included in the Turdidae in the main text and raised to family rank in the addenda, p. 885); Mimidae, 12 genera, 33 species and 17 additional subspecies; Sturnidae, including the common Starling, introduced from Europe; Ploceidae, 2 genera and 2 species, introduced into Porto Rico from Africa; Alaudidae, 2 genera,—*Alauda*, of casual occurrence in Greenland and the Bermudas, and *Otocoris*, with one species and 25 subspecies; Oxyruncidae, monotypic; Tyrannidae, 47 genera, 133 species and 39 additional subspecies; Pipridae, 7 genera, 15 species and 2 additional subspecies; Cotingidae, 18 genera, 32 species and 18 additional subspecies. In addition to the 103 genera and 417 species and subspecies formally treated, nearly half as many more are included in the keys and footnotes, so that in many cases nearly all the extralimital South American species of the included genera are passed in review.

Most of the innovations in classification were first made in a special

<sup>1</sup> The Birds of North and Middle American: A Descriptive Catalogue of the Higher Groups, Genera, Species, and Subspecies of Birds known to occur in North America, from the Arctic Lands to the Isthmus of Panama, the West Indies and other Islands of the Caribbean Sea, and the Galapagos Archipelago. By Robert Ridgway, Curator, Division of Birds. — Part IV.

Family Turdidae—Thrushes. Family Alaudidae—Larks. | Family Zeledoniidae—Wren-Thrushes. Family Oxyruncidae—Sharp-bills. | Family Mimidae—Mockingbirds. Family Tyrannidae—Tyrant Flycatchers. Family Sturnidae—Starlings. Family Pipridae—Manakins. | Family Ploceidae—Weaver Birds. Family Cotingidae—Cotingas. | — | Washington: Government Printing Office, 1907. = Bulletin of the United States National Museum, No. 50, Part IV.—8vo, pp. i-xxii + 1-973, pl. i-xxxiv.

<sup>2</sup>For notices of previous Parts in this Journal, see Vol. XIX, Jan. 1902, pp. 97-102; Part II, Vol. XX, Jan. 1903, pp. 73-76; Part III, Vol. XXII, April, 1905, pp. 219-222.

paper published in January, 1906,<sup>1</sup> but a few further changes are here made, especially in nomenclature, where *Myiochanes* replaces *Contopus* and *Procnias* supplants the familiar name *Casmorinchos* (or *Chasmorhynchus*, as usually written), etc., and original spellings of many names replace the emended forms of purists. *Planesticus* takes the place of *Merula*, but *Galeoscoptes* remains. The departures from the A. O. U. Check-List names of North American birds are, however, few, and have mostly already been adopted by the A. O. U. Committee, though not yet announced.

The present volume is marked by the same painstaking bibliographic research and attention to details that so eminently characterize its predecessors in the series, and we welcome it with the same sense of gratitude to the author for his invaluable contribution to systematic and faunistic ornithology. The thirty-odd plates of structural details, drawn mostly by J. H. Hendley of Washington, are an important adjunct to the text.—J. A. A.

**Townsend and Allen's 'Birds of Labrador.'**—This important summary<sup>2</sup> of present knowledge of the birds of Labrador is based, the authors inform us, on examinations of all the literature on the subject they have been able to find, and on a visit by them to the Labrador coast in the summer of 1906. The paper includes an account of the topography of Labrador, its faunal areas and bird migration; its ornithological history and the bird and egg destruction that have disgraced its coast and inlands, followed by an annotated list of its birds, and a bibliography. The historical part begins with George Cartwright's 'Journal,' published in 1792, and mentions in more or less detail the visits of other naturalists down to the 'Neptune' expedition of 1903-1904, including the journeys of Audubon (1833), Storer (1849), Bryant (1860), Coues (1860), Verrill (1861), Packard (1860 and 1864), Stearns (1875, 1880, 1882), Turner (1882-1884), and others, some of whom barely touched its southern coast. After recounting the barbarous havoc of the 'eggers' and the wholesale slaughter of geese and other waterfowl for their flesh or feathers, it is asked "What will be the result of all this if nothing be done to stop the destruction?" The answer is obvious,—the entire depopulation of the water bird resorts of the Labrador coast and adjacent islands.

In the systematic list 259 species and subspecies are considered, of which two are extinct, and 44 are regarded as having been wrongly attributed to Labrador, leaving 213 as authenticated Labrador species. A tabular statement gives the approximate number of birds seen by the authors in

<sup>1</sup> Some Observations concerning the American Families of Oligomyodian Passeres. By Robert Ridgway. Proc. Biol. Soc. Wash., XIX, pp. 7-16, Jan. 1906.

<sup>2</sup> Birds of Labrador. By Charles W. Townsend, M. D., and Glover M. Allen. Proc. Boston Soc. Nat. Hist., Vol. XXXIII, No. 7, pp. 277-428, pl. xxix (map). July, 1907.

Labrador, July 10 to August 3, 1906, with localities and date of observations, the list numbering about sixty species.

The Labrador of the present paper includes the whole peninsula commonly known by that name, extending from the Gulf of St. Lawrence to Hudson Strait, its eastern coast extending from N. Lat.  $52^{\circ}$  to about  $63^{\circ}$ . Faunally it extends from the Arctic barren grounds, which wholly occupy its northern part and a narrow strip along the entire eastern coast, across the Hudsonian and into the Canadian zone, the latter extending, in a general way, to "the latitude of Hamilton Inlet." The characteristic species of both plants and birds are enumerated for each of the three zones.

Among the points of special ornithological interest are the notes on the Great Auk, the Labrador Duck and the Eskimo Curlew, and on various species wrongly attributed to Labrador. *Otocoris alpestris praticolor* is eliminated as a bird of Labrador, "the Horned Lark of the Labrador coast, both eastern and southern," being considered as "the northern race, *Otocoris alpestris alpestris*"; and in this connection the alleged recent eastward extension of *praticola* is again considered as probable. The supposed Labrador race of the Savanna Sparrow (*Passerculus sandwichensis labradorius* Howe) is again shown to be untenable, even Mr. Oberholser, contrary to his "previous suspicions," being unable to find "any substantial difference worth recognizing by name." The determination of the status of the Labrador Horned Lark and Savanna Sparrow was among the incentives that induced the authors to undertake the Labrador trip. Altogether the paper that has resulted is one of unusual interest and value, clarifying and summarizing our knowledge of Labrador ornithology.—J. A. A.

**Townsend's 'Along the Labrador Coast.'**<sup>1</sup>—This is an entertaining narrative of the trip along the Labrador coast that furnished the basis of Townsend and Allen's 'Birds of Labrador,' described above. It consists, as would be expected, mainly of notes on the natural history, and especially on the birds of the Labrador coast, but contains as well an interesting account of the country, its industries and people. The narrative is pleasantly written, and as little worth noting appears to have escaped the author's attention it is full of general as well as ornithological information about the parts of the country visited. The author's ornithological observations are here recorded in much greater fulness and much more informally than in the 'Birds of Labrador,' and have thus the freshness of the daily note-book jottings of the bird-lover in fresh fields. An index, which gives the technical as well as the common name of the species observed, gives definiteness as well as easy access to the natural history matter of the text.

<sup>1</sup> Along the | Labrador | Coast | — | By | Charles Wendell Townsend, M. D. | Author of "The Birds of Essex County" | With illustrations from Photographs | and a map [Seal] — | Boston Dana Estes & | Company Publishers | [1907] (no date). Price, \$1.50.

'Along the Labrador Coast' is thus an entertaining and instructive narrative of much literary merit.—J. A. A.

**Clark on New Birds from Eastern Asia and the Aleutian Islands.**<sup>1</sup>—This paper, the author states, is based mainly on a collection of birds made by the late Mr. P. L. Jouy during a residence of over three years in Korea. This collection, containing 554 specimens, was being worked up by Mr. Jouy at the time of his death in 1894, but his report was never completed, and there have been as yet only incidental reference to a few of the species. The new forms here described have come to light through the preparation by Dr. Clark of a report on the ornithological results of the recent cruise of the United States Fisheries steamer 'Albatross,' during which he has been permitted to make use of the Jouy and other pertinent material in the National Museum.

The 18 new species and subspecies here characterized include a new ptarmigan (*Lagopus rupestris chamberlaini*) from Adak Island, Aleutian Islands, collected by Mr. C. H. Townsend in 1893. It is described as "the grayest and one of the lightest" of the local forms of ptarmigan of the Aleutian chain. The new forms are mostly from Korea, but include five or six from Japan. A new genus, *Tisa*, is proposed for *Emberiza variabilis* Temminck, which has heretofore been referred to various genera by different authors.—J. A. A.

**Blackwelder's Notes on Chinese Zoölogy**—In this Report<sup>2</sup> the birds occupy pp. 483-506, and is based on a collection of 64 specimens, representing 49 species, "supplemented by descriptions of 81 additional species, individuals of which were examined in the hand or seen at short range and described at the time of observation. Regarding some of the latter there is necessarily more or less doubt." The identification of the specimens is accredited to Dr. Charles W. Richmond, and the single new form (*Olbiorchilus fumigatus idius* Richmond) rests on his inedited description. Of the 132 species recorded about twenty are entered as doubtfully determined and more than half of the others rest on field determinations of birds seen in life. Colored plates of six species, drawn by Mr. J. L. Ridgway, illustrate the report on the birds. The region traversed includes portions of the Provinces of Chi-li, Shan-tung, Lian-tung, Shan-si and Shen-si.—J. A. A.

**Bangs on Birds from Costa Rica and Chiriquí.**<sup>3</sup>—This paper is based on

<sup>1</sup> Eighteen new Species and one new Genus of Birds from Eastern Asia and the Aleutian Islands. By Austin H. Clark, of the United States Bureau of Fisheries. Proc. U. S. Nat. Mus., Vol. XXXII, pp. 467-475. Published June 15, 1907.

<sup>2</sup> Research in China. Expedition of 1903-04, under the Direction of Bailey Willis. Report on Zoölogy, by Eliot Blackwelder. Extracted from Carnegie Institution of Washington Publication No. 54, Research in China, Vol. I, Part II, pp. 481-508, pl. col. Ixviii-lxiii. Published June, 1907.

<sup>3</sup> Notes on Birds from Costa Rica and Chiriquí, with descriptions of new forms and new records for Costa Rica. By Outram Bangs. Proc. Biol. Soc. Washington, Vol. XIX, pp. 101-112. Published July 30, 1907.

Mr. C. F. Underwood's collection, consisting "of 3,365 skins, representing about 611 species and subspecies," recently purchased by Mr. John E. Thayer of Lancaster, Mass. The collection contains many specimens identified by the late Osbert Salvin, and is rich in young birds in nestling plumage. "The dates on the labels cover nearly a score of years and the collection is the result of Underwood's laying aside the better things secured by him during this period." It is thus fortunate that this important collection was secured by Mr. Thayer in the interest of American ornithologists.

Besides the new records for Costa Rica and the critical comment on various species, eight species and subspecies are described as new. In his remarks on the various forms of *Stelgidopteryx*, Mr. Bangs emphatically reaffirms his "belief that there is *but one species of Stelgidopteryx*."—J. A. A.

**Clarke 'On the Birds of the Weddell and adjacent Seas.'**—In his third paper on the 'Ornithological Results of the Scottish National Antarctic Expedition' Mr. Clarke<sup>1</sup> deals with the bird-life of the Antarctic Ocean southward of the 60th parallel of south latitude, or of the Weddell Sea and adjacent waters. Following an itinerary of the 'Scotia' in these high southern waters, is a summary of the leading ornithological observations, in which it is stated that four species of birds were added to the short list of nine previously known to have occurred south of the Arctic Circle, these additions including the Arctic Tern (*Sterna macrura = paradisaea*). "A specially important ornithological feature of these voyages of the 'Scotia,' says Mr. Clarke, "was the presence in the Polar Sea of a number of species of Petrels far beyond the southern limits of their breeding areas. This seems to indicate that at the close of the southern summer numbers of Hutton's Sooty Albatrosses (*Phaethetria cornicoides*), Cape Petrels (*Daption capensis*), Giant Petrels (*Ossifraga gigantea*), Antarctic Petrels (*Thalassaea antarctica*), Giant Silver Petrels (*Priocella glacialisoides*), Blue Petrels (*Halobaena carula*), and *Estrilda brevirostris*) cross the Antarctic Circle and sojourn among the polar ice ere they retreat northwards to pass the winter in more genial oceanic resorts. It is possible, however, that some of these visitors to the far south are non-breeding birds, and, if so, they may have spent the entire summer there. The Tubinares are, as is well known, great wanderers, but these very remarkable southern incursions are, perhaps, to be explained by the extraordinary abundance of food to be found in the waters of the far south in the summer and autumn, which allures some of the birds further and further towards the pole, until the ice-barrier, which almost girdles the Antarctic Continent, arrests further progress, since at its base the food-supply entirely ceases. This, too,

<sup>1</sup> Ornithological Results of the Scottish National Antarctic Expedition.—III. On the Birds of the Weddell and adjacent Seas, Antarctic Ocean. By Wm. Eagle Clarke, F. R. S. E., F. L. S., The Royal Scottish Museum. *Ibis*, April, 1907, pp. 325-349, and map.

explains why our familiar Arctic Tern (*Sterna macrura*) passes the southern summer (our northern winter) amid these ever-icy seas."

The systematic list numbers 17 species, with extended comment on their distribution and habits. The only Tern previously recorded from this region is the well-known South American *Sterna hirundinacea*. But "when the 'Scotia' sailed from the South Orkneys she left the *Sterna hirundinacea* behind her. Other Terns were met with, often in considerable numbers, and specimens were fortunately obtained in widely scattered portions of the Weddell Sea. These, strange to say, I found to belong to the most northern representative of their genus, namely, to *Sterna macrura*, the Arctic Tern! Thus this familiar bird to British ornithologists would seem to have the most extensive latitudinal range to be found among vertebrate animals, since it is now known to occur from 82° N. to 74° 1' S. .... They were often observed in considerable numbers, and are logged for March 5th, 1904, as being seen in thousands in 72° 31' S.; while from the 9th to the 13th of the same month, many were seen when off Coats Land, in 74° 1' S., 20° 0' W.,.... That it is only a winter visitor does not admit of doubt, for the bird certainly does not breed there; nor is any other Tern, so far as we know, a native of the Antarctic Continent." As is now well-known, somewhat reversed conditions occur in the case of the Wilson's Petrel (*Oceanites oceanicus*), which breeds in the Antarctic islands and wanders north in the northern summer to the North Atlantic.—J. A. A.

**Goeldi's 'Album de Aves Amazonicas.'**—Fasciculus III (pll. xxiv–xlvi) brings to a close this noteworthy supplement<sup>1</sup> of 48 colored plates, illustrating Dr. Goeldi's well-known 'Aves do Brazil,' published 1894–1900 (2 vols. 12mo). About 400 species are very successfully illustrated, by the tricolor process, for the most part with excellent results. They thus form a most desirable and valuable supplement to the text, from the point of view of not only the general reader, but the student of South American ornithology. We tender the author our sincere congratulations on the results thus so happily achieved.

Dr. Goeldi, after twenty years' residence in the American tropics, has retired from the active directorship of the great museum which so appropriately bears his name, it being mainly his own creation, returning to Switzerland, his native land, still in vigorous health, with, we trust, many years of scientific activity before him.—J. A. A.

<sup>1</sup> Museu Goeldi | (Museu Paraense) | de Historia Natural e Ethnographia | — | Album de Aves Amazonicas | organizado pelo Professor | Dr. Emilio A. Goeldi, | Director do mesmo Museu | — | Publicação iniciada por ordem de S. Ex<sup>cia</sup> O Sur Dr José Paesde Carvalho, | ex-governador | e continuada sob o Governo de S. Ex<sup>cia</sup> O S<sup>ra</sup> Dr Augusto Montenegro | — | Desenhos do S<sup>ra</sup>. Ernesto Lohse, Desenhista-Lithographo do Museu Goeldi | — | Suplemento illustrativo a' obra "Aves do Brazil" | pelo Dr. Emilio A. Goeldi | Livraria classica de Alves & Cie, Rio de Janeiro, | 1894–1900 (2 volumes) | 1900–1906,—4to, fasc. I, 1900, pll. 1–12; fasc. 2, 1902, pll. 13–24; fasc. 3, 1906, pll. 24–48. With title-page, contents, indexes, and directions for binding. Also excerpts (8 pp. 4to) from reviews and personal acknowledgments, etc.

**Mrs. Davenport's 'Birds of Windham and Bennington Counties, Vermont.'**<sup>1</sup>—These two counties embrace the southern fourth of the State of Vermont, and aggregate an area of about forty miles square, varying in elevation from about 200 feet in the valley of the Connecticut River, which forms its eastern border, to nearly 4000 feet, in the interior. This region has been Mrs. Davenport's home for the greater part of her life, and she has become familiar with its flora and fauna through many years of careful exploration. The character of the country is first described, followed by an annotated list of the birds, numbering 176 species. The annotations contain much definite information about the manner of occurrence of the species. Of the twelve species of *Dendroica* recorded eight are given as more or less common breeding summer residents. Unfortunately the list is badly disfigured by typographical errors, for which the author is doubtless not responsible.—J. A. A.

**Herman's The Protection of Birds in Hungary.**<sup>2</sup>—Hungary — greatly to her credit — has ever taken a most active interest in bird protection, and from the first inception of the movement in Europe for the international protection of birds has been one of its strongest supporters. This work, issued in English, by order of the Hungarian Minister of Agriculture, and prepared by Otto Herman, the well-known Hungarian ornithologist and director of the Hungarian Central Bureau for Ornithology, is, in effect, an historical account of the efforts for bird protection in Europe, and of the present state of international bird protection. Preceding the historical part is an introduction (pp. 9-23) treating of the generalities of the subject, under 'Birds and Nature' and 'Birds and Man.' The 'Historical Part' begins with a general statement respecting the changes unfavorable to bird-life due to the spread of agriculture, and the resultant need for systematic bird protection through legal enactments and international coöperation. Then follows a detailed account of the progress of bird protection in Europe, beginning with a meeting of German farmers and foresters in 1868 in advocacy of an international agreement, and of subsequent steps to the same end down to the International Convention for the Protection of Birds held in Paris in 1902, and the adoption, in 1906, of the 'International Convention for the Protection of Birds,' into the "Corpus Juris" of Hungary; which, "being endowed with the force of law, found the rational protection of birds in Hungary a *fait accompli*." The signatories to the Paris Convention (March 19, 1902) include, through their properly appointed representatives, the following countries: Austria, Prussia, Belgium, Spain,

<sup>1</sup> Birds of Windham and Bennington Counties. By Mrs. Elizabeth B. Davenport. Vermont Bird Club, Bulletin No. 2, pp. 5-14, July, 1907.

<sup>2</sup> Publication of the Royal Hungarian Minister of Agriculture | — | The International | Convention | for | The Protection of Birds | concluded in 1902; | and | Hungary, | Historical Sketch, | Written by order of his Exc. | Ignatius de Darángi, | Hungarian Minister of Agriculture, | By | Otto Herman | late M. P. | Director of the Hung. Centr. Bur. f. Ornithology, | [Seal] Budapest | Victor Hornyánszky, Court Printer | 1907 — 8vo, pp. v + 241.

France, Greece, Luxemburg, Monaco, Portugal, Sweden and Norway, and Switzerland. Great Britain is not in the list, but is, independently of the Convention, a strong supporter of bird protection. Italy, however, refused to sign; and not only this, legally sanctions and encourages the wholesale slaughter of the birds, even on their migrations, which all the other countries of Europe so strenuously protect!

The Paris 'Convention' consisting of 16 articles and two schedules (schedule I, useful birds; schedule II, noxious birds), is here published in full. It provides protection for all of the useful birds, their nests and eggs, and prohibits the use of traps, cages, nets, nooses, lime-twigs, and any other kind of instruments used for the purpose of rendering easy the wholesale capture or destruction of birds. Destruction of game by firearms is allowed during prescribed open seasons. During the close season for any kind of game bird it is unlawful to import, sell, or offer to sell, or transport or deliver any such birds. With this we may contrast the position of Italy, which instructed her delegate to sign no "binding schedule," and added that "no agreement refused by Italy could be of any advantage to Hungary or Austria"—a fine dog-in-the-manger spirit, quite in keeping with her approval of the brutal wholesale destruction of the most useful insectivorous birds, as well as all others, that visit this country in winter on migration, "and are therefore alien property as far as Italy is concerned."

'The Protection of Birds in Hungary' occupies pp. 145-175, and includes the bird protection act now in force in that country. Not only is the protection of birds rigidly insured, but the Hungarian Ministry of Commerce issued on June 12, 1906, an order for artificial nesting-boxes to be placed in the State forests, comprising five million acres; and also, at the same time, issued a decree providing for bird-days and tree-days in the scheme of work of elementary schools. As early as 1898-99 the Minister of Agriculture caused to be published (in Hungarian) a large work (in two volumes) by Stephen Chernel on economic ornithology, and in 1900 ordered its translation into French, in order to make it accessible to the people of other nationalities, following this in 1901 with a smaller work, by Otto Herman, with illustrations by T. Csörgey, on 'Useful and Noxious Birds,' prepared with special reference to reaching the lower classes as an appeal in behalf of the birds.—J. A. A.

**Williams's 'Game Commissions and Wardens.'**<sup>1</sup>—This is a digest of provisions for the enforcement of game laws, and comprises three parts. "Part I contains a historical summary of the evolution of the warden service and general discussion of various features connected with warden work; Part II, a summary of the most important provisions of the laws stated in the briefest possible form and arranged in uniform sequence; Part III, extracts

<sup>1</sup> Game Commissions and Wardens, their Appointment, Powers, and Duties. By R. W. Williams, Jr., Game Law Assistant, Biological Survey, U. S. Department of Agriculture, Biological Survey — Bulletin No. 28, 8vo, pp. 1-285, with maps and diagrams. Issued August 1, 1907.

from the statutes relating to game warden departments, duties and powers of officers, and special provisions connected with administration. No effort has been spared to make the report as complete and accurate as possible. In addition to extracts from the statutes, it contains the results of seven years' observation of the methods of administering game laws, and the conclusions of those who have contributed to the discussion of points of special interest." The foregoing is from the Preface (p. 10), by Dr. T. S. Palmer, and states concisely the scope and purpose of this important publication, which must be of great value to persons interested in game protection, and especially to those charged with the enforcement of game laws. Under 'Game law administration' (pp. 43-99) are defined the powers of officers and methods of procedure in respect to arrest, search and seizure; prosecutions, in reference to who may prosecute, the methods, and the results, etc. The 'Summaries of the provisions relating to enforcement' give, in concise form, the provisions at present in force in all of the States and Territories, and include the duties of officers, and the offenses and the required evidence on which to base prosecutions. The 'Extracts from laws with special reference to enforcement' occupies the second half of the 'Bulletin,' and presumably comprise all of the essential features. We have thus in convenient form a condensed 'law-book' on game protection which should meet an actual need.—J. A. A.

**Anderson's 'The Birds of Iowa.'**—In a paper<sup>1</sup> of nearly 300 pages, Mr. Anderson records 355 species and subspecies as of known occurrence in the State, 309 of which are "found more or less regularly," and 44 as only "casual or accidental" visitants; one species, the Carolina Paroquet, is given as extinct, and another, the House Sparrow, as the only introduced species. Twenty-five additional species are given in a 'Hypothetical List' as having been taken "very close to the borders of Iowa," or "reported as occurring in Iowa on what appears to be insufficient evidence." Some of these might well have been included in the main list, and it is only a question of time when all may doubtless be added on the basis of actual capture within the State; but their present exclusion as Iowa birds is commendable.

An 'Introduction' of 20 pages states the scope and basis of the work, the topographic, climatic, and faunal features of the State, and contains a list of the large number of contributors who have furnished valuable notes or local lists, covering most of the counties of the State.

The method of treatment includes, usually, a general statement regarding the character of the bird's occurrence in the State, followed generally by a paragraph of detailed county records, especially in the case of the rarer species, giving locality, date and authority for the records cited. A large part of the text thus consists of previously unpublished records, and

<sup>1</sup> *The Birds of Iowa.* By Rudolph M. Anderson. Proc. Davenport Acad. Sci., Vol. XI, pp. 125-417, March, 1907.

adds greatly to our knowledge of the distribution of many species of birds within the boundaries of Iowa. The list is thus voluminously annotated, the notes varying, as the case may require, from a dozen lines to a page or two to the species. It is, however, all pertinent matter, and the list as a whole is an unusually important contribution to faunistic ornithology.

A bibliography of 10 pages consists of the titles of, for the most part, general works that include incidental references to Iowa birds; but as they are unannotated, and as the minor records and 'notes' contained in ornithological and other periodicals are altogether omitted, it falls far short of being a satisfactory bibliography of the subject treated. Reference is here made to 'The Literature of Iowa Birds. A Complete Record of the Published Writings on the Birds of Iowa,' by Paul Bartsch, "prepared [in 1899] as a thesis for the degree of Master of Science," and forming three volumes of typewritten manuscript, deposited in the library of the State University of Iowa. It is to be hoped that Dr. Bartsch's work may eventually be published, at least in extended abstract, and thus be made available for more general use.—J. A. A.

**Rich's 'Feathered Game of the Northeast.'**<sup>1</sup> — This handsomely printed and effectively illustrated book of about 450 pages treats of about ninety species of the game birds of the "upper eastern coast" of North America, from the standpoint of the sportsman, by a sportsman, well qualified for the task by personal experience in the field and literary and artistic ability. It should prove of interest not only to sportsmen but to the general reader, and to some extent to ornithologists. The writer has evidently some knowledge of ornithology, the technical names of the birds being 'up to date,' and their relationships and distribution, when referred to, are generally correctly stated, although his surmise that "possibly a few" Heath Hens may still "be left on the eastern end of Long Island" is a little out of date. The author is heartily in favor of better protection for our rapidly decreasing game birds, and in his preface and throughout his book urges "upon the great brotherhood of sportsmen" moderation in the use of the gun, and both in the preface and elsewhere (see under American Woodcock, p. 127) favors the abolition of spring shooting, the prohibition of the sale of game, and the limitation of the number of birds which a man may kill in a day's hunt. The illustrations, from drawings by the author, are a serviceable addition to the text, being for the most part good representations of the birds depicted.—J. A. A.

<sup>1</sup> Feathered Game of the Northeast | By | Walter H. Rich | With illustrations by the author | New York | Thomas Y. Crowell & Co. | Publishers.—No date (1907). 8vo, pp. xvi + 432, frontispiece in color (Wood Duck), and 84 halftone plates. \$3.00 net, postage 30 cents extra.

## CORRESPONDENCE.

## Protective Coloration.

EDITORS OF 'THE AUK':—

Dear Sirs: — I wish to record in 'The Auk' the main results, up to date, of my study of Protective Coloration. These were all foreshadowed in my first article in 'The Auk' (XIII, 1896, pp. 124-129, 10 illustr.), and, later, in a paper published in the Transactions of the Entomological Society of London,<sup>1</sup> I was able to present the subject of patterns in a much more developed shape. What I now wish to record is mainly what I communicated to the annual meeting of the A. O. U. in 1904, but which the reporters failed to get, so that it remains, as yet, unpublished. It is this: It now proves to be the case that all patterns and colors, upon all animals whatsoever, except such as live in the dark, or are neither predatory nor preyed upon, are, *when seen against the background against which their enemy (or prey) would see them at the critical moment*, in expressibly *perfect pictures* of this background, and therefore obliteratively colored. The marvellous perfection of the scene thus painted on each animal is, of course, only appreciable by painters. It is such that the different parts of any resplendent bird's costume, peacock, wood duck, or blue jay, make, when separated, and merely slightly rearranged, a scene of their habitat that defies, in its realism, all painters.

The one thing that has kept even artists from beginning to see this fact is that no one has perceived that obliterative coloration means *matching a certain background*, not a general resemblance to surroundings. This old phrase means actually nothing. For instance, a white heron and a brown frog may be in the *same surroundings*, yet the heron sees the brown frog against brown mud, while the frog sees the white heron against the *sky!* — the nearest match possible, and one which effaces the heron's tell-tale upper contours, especially when the sky is white, or at night. Till now, however, observers have regarded the frog and heron, and discussed them, from *men's* standpoint, and called *one* protectively colored, and *one* conspicuous. This principle is universal in nature.

My son and I are now sending to the press a book demonstrating my results up to now. Fortunately it *involves no theory* whatever, but is all shown to be susceptible of absolute ocular proof. It does not *say* that patterns and countershading *exist to conceal animals*, but shows that they do always conceal them.

ABROTT H. THAYER.

<sup>1</sup> Protective Coloration in its Relation to Mimicry, Common Warning Colors, and Sexual Selection. Trans. Entomol. Soc. of London, 1903, Part IV, pp. 553-569. Dec., 1903.

## NOTES AND NEWS.

DR. WILLIAM LAGRANGE RALPH, a Member of the American Ornithological Union, died in Washington, D. C., on July 8, 1907, of a complication of organic heart and kidney lesions in the fifty-seventh year of his age. He leaves a widow, an adopted daughter, Katharine Louise, and two brothers, G. Fred Ralph and Henry Ralph. He was born in Holland Patent, N. Y., June 19, 1851, and remained there until 1863 when he moved with his parents to Utica. In the dozen years of early life spent among the fields and woods of his native home and surrounded on all sides by a rich and ever varying assortment of bird life, the seed of his future love for ornithology was sown and gradually ripened as time went on. He often spent the greater part of his vacations and holidays at Holland Patent with his grandfather, who, as an ardent sportsman and in a general way an interested observer of all birds, encouraged the boy by precept and example to look for the many secrets which Nature held in store for him. Here he began to watch the birds construct their nests and to levy an occasional egg from them to add to his rudimentary collection.

He received his preliminary education from the schools of Utica and Whitestone Seminary, and in 1879 completed his studies and secured his medical degree at the college of Physicians and Surgeons, Columbia University, New York City. Later in the same year he began to practice his profession in Utica, but owing to delicate health resulting from a weakened heart he gave up this exacting work and returned to a more quiet life. He evidently was glad of the opportunity to renew his research in ornithology which had been held somewhat in abeyance during his college life. Fortunately, being of independent means, he was able to devote unlimited time to study and to field work, which primarily was carried on among the rarer and more interesting birds of Oneida County and later was extended to much broader fields. Within a comparatively short time, through his own efforts and those of trained collectors, and by purchase, the foundation of a collection of eggs was formed which subsequently became one of the most valuable private collections in the country. During the summer much of his time was spent with the birds in the Northern woods, while in winter and spring the marshes and forests of Florida were explored in search of interesting nests and eggs.

When Major Bendire planned to write the 'Life Histories of North American Birds' he was well equipped, so far as western birds were concerned, but was sorely in need of reliable detailed information regarding the nesting habits of some of the rarer eastern species. This data in part, Doctor Ralph was able to furnish and in many places pages of almost literal quotation from his field notes may be found in this most valuable standard work. Major Bendire acknowledged in his introduction indebtedness for this material assistance.

Although Doctor Ralph gathered full notes and frequently was quoted

by others, so far as we know his only published papers were 'An Annotated List of the Birds of Oneida County, N. Y. and the Immediate Vicinity,' which was issued under joint authorship with Mr. Egbert Bagg of Utica, in 1886, and an addendum to this list published in 'The Auk' in 1890 (pp. 229-232).

After the death of Major Bendire in 1897 Doctor Ralph was made custodian of the egg collection of the National Museum, and in 1901 his title was changed to that of curator. From the very first when he began to associate with Major Bendire he took a deep interest in the Museum collection and from time to time made valuable donations of beautifully prepared and carefully identified eggs, aggregating upwards of 10,000 specimens. He also went to considerable trouble and expense in collecting mammals and other desiderata for the Museum, and on one occasion purchased a fine example of the extinct Philip Island parrot which was in danger of being sent abroad. He always was fond of studying the habits of wild creatures and of keeping them as pets. During the past few years he purchased and liberated in the Smithsonian grounds many gray squirrels for the purpose of giving pleasure to visitors and a show of wild life to this attractive spot. It was a familiar sight during cold wintry weather to see the Doctor hunting up his pets to furnish them with a liberal and needed supply of nuts or other food. A few days before his death, while in a very weakened condition, with great effort he went to his office, it is thought for the main purpose of seeing whether his pets there had had proper attention.

Although in delicate health Doctor Ralph seemed to look upon the bright side of life and was happiest when associating with or entertaining his chosen friends. He never tired talking over collecting or hunting experiences, and was most enthusiastic while listening to or giving details of some important capture or successful day in the field. He was unselfish, kind hearted and generous almost to a fault, and we feel that in his death the Union has lost a valuable member and his associates a devoted friend.—  
A. K. F.

THE SEVENTH INTERNATIONAL CONGRESS OF ZOOLOGY held a six days' session (August 19-24, 1907), in Boston, putting into effect without material change the program announced in the first preliminary circular of the Executive Committee issued in 1906 (see Auk, XXIII, Oct. 1907, p. 486). There was a large attendance of foreign delegates and members, and the zoologists of America were well represented, the registered attendance being about five hundred. The general meetings were held in Jordan Hall, New England Conservatory of Music, and the sectional meetings in the new buildings of the Harvard Medical School. President, and Chairman of the General Committee of the American Society of Zoologists, Alexander Agassiz; General Secretary of the Permanent Committee of the International Zoological Congress, R. Blanchard, Paris; Secretary of the Congress, Samuel Henshaw. The arrangements for the work of the Congress

and for its entertainment were elaborate, and the weather was exceptionally favorable. On Monday evening a reception was tendered by the Local Committee at the Art Museum, through the courtesy of the Trustees; on Wednesday evening a reception was given by the President at the Hotel Somerset. The mornings were occupied with the sectional meetings, the general sessions being held in the afternoons, at which the business of the Congress was transacted, followed by addresses, including the address of the President, and addresses by distinguished delegates on subjects of wide interest. The week closed with an excursion on Saturday day to Harvard University.

The Congress organized in ten Sections, as follows: I, Animal Behavior; II, Comparative Anatomy; III, Comparative Physiology; IV, Cytology and Heredity; V, Embryology and Experimental Zoölogy; VI, Entomology and Applied Zoölogy; VII, General Zoölogy; VIII, Palæozoölogy; IX, Systematic Zoölogy; X, Zoögeography and Thalassogeography. The names of these sections indicate how greatly changed has become the lines of zoölogical research during a single generation; of the 300 or more papers and addresses entered on the program, less than one third were listed under sections VII-IX. The attempt to organize a section of Ornithology (see *Auk*, XXIV, April, 1907, p. 239) failed through lack of response on the part of ornithologists, who, both abroad and at home, seemed to take little interest in the Congress. The eleven titles on the program relating to ornithology are: in Section I, J. P. Porter, A Comparative Study of Birds with respect to Intelligence and Imitation; J. E. Duerden, The Influence of Domestication on the Behavior of the Ostrich; F. H. Herrick, Organization of the Gull Community, a Study of the Communal Life of Birds. In Section II, W. A. Locy, The Fifth and Sixth Aortic Arches in Birds and Mammals. In Section IV, C. B. Davenport, Reversion in Poultry. In Section V, M. Blount, On the Cleavage and Formation of the Periblast and the Germ Wall in Pigeons; J. T. Patterson, On Gastrulation in Birds. In Section VII, S. A. Forbes, A Statistical Study of the Local Distribution and Ecology of Birds; C. W. Beebe, Geographic Variation in Birds, with special reference to Humidity. In Section VIII, C. H. Sternberg, *Hesperornis regalis*, the Royal Bird of the West. In Section X, F. M. Chapman, Remarks on the Geographical Origin of North American Birds. About sixty entries of "demonstrations, exhibits, etc." were on exhibition during the Congress, including instruments, and apparatus, models, drawings, books, and preparations, illustrating special lines of research.

The Report of the International Commission on Nomenclature was unanimously adopted at the general session held on Friday, and is of general interest to systematic zoölogists. In addition to several recommendations in amplification of Articles 8, 14, 20 and 29, and several general rulings, covering 'The nature of a systematic name,' 'The status of publications dated 1758,' 'The status of certain names published as manuscript names,' and 'The status of certain pre-Linnaean names reprinted subse-

quent to 1757,<sup>1</sup> Article 30 of the International Code of Zoölogical Nomenclature, as adopted at the Berne Congress in 1904, was cancelled and a new Article 30 adopted in its place. Article 30 provides for the determination of types of originally typeless genera. The new Article 30 includes practically all of the provisions of the old Article 30, amplified and made more explicit, especially in respect to 'types by subsequent designation,' or types by designation of a first reviser, and also by incorporating most of the rules and recommendations published by Dr. Charles Wardell Stiles, U. S. A., in September, 1905.<sup>1</sup> The new Article 30 (for a copy of which we are indebted to the kindness of the secretary of the International Commission on Nomenclature, Dr. Stiles), is herewith given in full:

"Art. 30.— The designation of type species of genera should be governed by the following rules (a—g), applied in the following order of precedence:

"I. Cases in which the generic type is accepted *solely* upon the basis of the original publication.

"(a) When in the original publication of a genus, one of the species is definitely designated as type, this species shall be accepted as type regardless of any other considerations. (Type by original designation.)

"(b) If, in the original publication of a genus, *typicus* or *typus* is used as a *new* specific name for one of the species, such use shall be construed as 'type by original designation.'

"(c) A genus proposed with a single original species takes that species as its type. (Monotypical genera.)

"(d) If a genus, without originally designated (see a) or indicated (see b) type, contains among its original species one possessing the generic name as its specific or subspecific name, either as valid name or synonym, that species or subspecies becomes *ipso facto* type of the genus. (Type by absolute tautonomy.)

"II. Cases in which the generic type is not accepted *solely* upon the basis of the original publication.

"(e) The following species are excluded from consideration in selecting the types of genera:

"(a) Species which are not included under the generic name at the time of its original publication.

"(b) Species which were *species inquirendæ* from the standpoint of the author of the generic name at the time of its publication.

"(c) Species which the author of the genus doubtfully referred to it.

"(f) In case a generic name without originally designated type is proposed as a substitute for another generic name, with or without type, the type of either, when established, becomes *ipso facto*, type of the other.

"(g) If an author, in publishing a genus with more than one valid

<sup>1</sup> The International Code of Zoölogical Nomenclature as applied to Medicine, Hygienic Laboratory, Bulletin No. 24. Washington: Government Printing Office, 1905. 8vo, pp. 50.

species, fails to designate (see *a*) or to indicate (see *b*, *d*) its type, any subsequent author may select the type, and such designation is not subject to change. (Type by subsequent designation.)

"The meaning of the expression 'select a type' is to be rigidly construed. Mention of a species as an illustration or example of a genus does not constitute a selection of a type.

"III. RECOMMENDATIONS.—In selecting types by subsequent designation, authors will do well to govern themselves by the following recommendations:

"(h) In case of Linnaean genera, select as type the most common or the medicinal species. (Linnaean rule,<sup>1</sup> 1751.)

"(i) If a genus, without designated type, contains among its original species one possessing as a specific or subspecific name, either as valid name or synonym, a name which is virtually the same as the generic name, or of the same origin or same meaning, preference should be shown to that species in designating the type, unless such preference is strongly contraindicated by other factors. (Type by virtual tautonomy). Examples: *Bos taurus*, *Equus caballus*, *Oris aries*, *Scomber scombrus*, *Spharostoma globiporum*; contraindicated in *Dipetalonema* (compare species *Filaria dipetala*, of which only one sex was described, based upon one specimen and not studied in detail).

"(j) If the genus contains both exotic and nonexotic species from the standpoint of the original author, the type should be selected from the nonexotic species.

"(k) If some of the original species have later been classified in other genera, preference should be shown to the species still remaining in the original genus. (Type by elimination.)

"(l) Species based upon sexually mature specimens should take precedence over species based upon larval or immature forms.

"(m) Show preference to species bearing the name *communis*, *vulgaris*, *medicinalis*, or *officinalis*.

"(n) Show preference to best described, best figured, best known, most easily obtainable species, or one of which a type specimen can be obtained.

"(o) Show preference to a species which belongs to a group containing as large a number of the species as possible. (De Candolle's rule.)

"(p) In parasitic genera, select if possible a species which occurs in man or some food animal, or in some very common and widespread host species.

"(q) All other things being equal, show preference to a species which the author of the genus actually studied at or before the time he proposed the genus.

"(r) All other things being equal, page precedence should obtain in selecting a type.

<sup>1</sup> "Si genus receptum, secundum jus naturae et artis, in plura dirimi debet, tum nomen antea commune manebit vulgatissimae et officinali plantae."

"(s) In case of writers who habitually place a certain leading or typical species first as 'chef de file,' the others being described by comparative reference to this, this fact should be considered in the choice of the type species.

"(t) In case of those authors who have adopted the 'first species rule' in fixing types, the first species named by them should be taken as types of their genera."

The secretary in presenting the report of the Commission, stated that the Code, as now constituted, would probably cover 90 % of the cases that may arise, and would in all probability prove satisfactory to 90 % of zoologists.

The Congress adjourned on Friday, to meet in Gratz in 1910, under the presidency of Professor Ludwig von Graff. On Sunday Woods Hole was visited *en route* to New York, the members of the Congress arriving in New York Monday morning and remaining through the week. The Congress was received on Monday by the trustees and officers of the Department of Zoölogy of Columbia University; on Tuesday as guests of the trustees and officers of the American Museum of Natural History; on Wednesday the Congress visited Cold Spring Harbor, as guests of the Brooklyn Institute of Arts and Sciences and the Carnegie Station for Experimental Evolution; Thursday was devoted to visits to the New York Zoölogical Park and Aquarium; on Thursday an excursion was made to West Point and Castle Rock, the residence of Professor Henry Fairfield Osborn, as guests of Professor Osborn. On Saturday many of the members accepted invitations from the trustees of Yale University and Princeton University to visit New Haven and Princeton. During the following week the foreign members and delegates visited Philadelphia, Washington, Niagara Falls, and Toronto.

The chief advantage of such gatherings is, of course, the opportunity thus afforded of bringing together for social intercourse a large number of investigators who otherwise may never know each other except through correspondence or published writings. In the present case many of the foreign delegates made their first acquaintance with American scientific institutions, in which they found much of interest and not a little to admire.

THE TWENTY-FIFTH ANNUAL CONGRESS of the American Ornithologists' Union will be held in Philadelphia, beginning on the evening of Monday, December 9, 1907. The evening session will be for the election of officers and members and for the transaction of routine business. Tuesday and the following days of the session will be for the presentation and discussion of scientific papers, and will be open to the public. Members intending to present communications are requested to forward the titles of their papers to the Secretary, Mr. John H. Sage, Portland, Conn., so as to reach him not later than December 5.

## INDEX TO VOLUME XXIV.

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[New generic, specific, and subspecific names are printed in **heavy-faced** type.]

ABBOTT, Clinton G., summer bird-life of the Newark, New Jersey, Marshes, 1-11; American Coot nesting near Newark, N. J., 436. *Acanthis*, 199.  
    *hornemannii exilipes*, 79, 403.  
    *linaria*, 79, 107, 126, 188, 404.  
    *linaria holboellii*, 79, 404.  
    *linaria rostrata*, 79, 404.  
*Accipiter atricapillus*, 72, 110, 142, 182-186, 187, 214, 437.  
    *bicolor schistochlamys*, 290.  
    *cooperi*, 17, 49, 72, 260, 283, 432.  
    *velox*, 17, 49, 72, 260, 428.  
*Actitis*, 198.  
    *macularia*, 16, 95, 254, 427, 432.  
*Actodromas bairdi*, 94, 253, 425.  
    *fuscicollis*, 140, 339, 425.  
    *maculata*, 95, 253, 425.  
    *minutilla*, 95, 253, 425.  
*Æchmophorus occidentalis*, 419.  
*Ægialeus semipalmatus*, 291.  
*Ægialitis collaris*, 291.  
    *meloda*, 428.  
    *semipalmata*, 95, 427.  
*Aëronautes melanoleucus*, 300.  
*Æthia*, 190.  
*Æthya*, 190.  
*Agelaius phoeniceus*, 8, 11, 19, 51, 78, 284, 433.  
    *phœniceus arctolegus*, 332-336, 397.  
    *phœniceus fortis*, 334.  
*Agytria decora*, 295.  
*Aix*, 199.  
    *sponsa*, 320, 431.  
*Alauda arvensis blakistoni*, 279.  
*Alauda trivialis*, 199.  
*Albatross*, Black-footed, 58.  
    *Hutton's Sooty*, 454.  
*Alca cristatella*, 190.  
    *psittacula*, 198.  
    *pygmæa*, 198.  
**Alcella**, 197.  
*Alle alle*, 186.  
*Allen, Glover M.*, see *Townsend, C. W.*  
*Allen, J. A.*, the Rio Grande Seed-eater, its status and technical history, 26-30.  
*Allison, Andrew*, notes on the spring birds of Tishomingo County, Mississippi, 12-25. See also *Beyer, Geo. E.*  
*Alphéraly, Serguis*, notice of his 'The Geese of Europe and Asia,' 229.  
*Amaurospiza coneolor*, 311.  
*Amblycercus holosericeus*, 308.  
*American Museum of Natural History*, addition of important bird groups in, 368.  
*American Ornithologists' Union*, Twenty-fourth Congress of, 89-94; Committee on revision of Code of Nomenclature, 119; Committee on Nomenclature and Classification of North American Birds, 119, 367; Twenty-fifth Congress of, 466.  
*American Ornithology* (magazine), discontinuance of, 239.  
*Amizilis cinnamomea*, *cinnamomea*, 295.  
*tzacatl dubusi*, 295.

*Ammodramus*, 193.  
*leconteii*, 80.  
*maritimus macgillivrayi*, 102.  
*nelsoni*, 80.  
*Ammospiza*, 193.  
*Ampelis*, 362.  
*cedrorum*, 22, 51, 82, 285, 362.  
*garrulus*, 82, 107, 128, 223.  
*Anas boschas*, 248, 283, 317, 382,  
 421.  
*fulvigula*, 318.  
*fusca*, 198.  
*galericulata*, 199.  
*marila*, 191.  
*nigra*, 198.  
*obscura*, 318, 382.  
*obseura rubripes*, 138.  
*prima*, 191.  
*querquedula*, 191.  
 Anderson, Rudolph M., notice of his  
 'The Birds of Iowa,' 458.  
*Anhinga*, 316.  
*Anhinga anhinga*, 316.  
*Anous stolidus*, 315.  
*Anser albifrons gambeli*, 321.  
*Anthus*, 199.  
*antarcticus*, 115.  
*pensylvanicus*, 85.  
*Antrostomus*, 196.  
*carolinensis*, 18.  
*vociferus*, 18, 76.  
*Aphantochroa cuvieri*, 295.  
*Aquila chrysaëtos*, 73, 232, 264, 429.  
*Ara macao*, 292.  
*Aramides albiventris*, 359.  
*albiventris mexicanus*, 359.  
*albiventris plumbeicollis*, 359.  
*axillaris*, 359.  
*cajanea*, 291, 359.  
*Aramus giganteus*, 95.  
*Archibuteo*, 195.  
*ferrugineus*, 213, 264, 429.  
*lagopus sancti-johannis*, 73,  
 263.  
*Ardea cœrulea*, 139.  
*egretta*, 212.  
*Ardea Exotica Aurita*, 448.  
*herodias*, 16, 251, 423, 431.  
*minuta*, 192.  
*nycticorax*, 195.  
*stellaris*, 192, 195.  
*Ardetta*, 192.  
*exilis*, 2, 7, 11.  
*neoxena*, 338.  
*Arenaria morinella*, 141.  
 Arnov, I. F., the American Cross-  
 bill in Camden Co., Ga., 439;  
 large set of Brown-headed Nut-  
 hatch's eggs, 447.  
*Arquatella maritima*, 435.  
*Arremon aurantiirostris*, 310.  
*Arremopon conirostris richmondi*,  
 310.  
*superciliosus superciliosus*, 310.  
*Asarcia variabilis*, 291.  
*Asio accipitrinus*, 74, 97, 268, 438,  
 439.  
*wilsonianus*, 74, 267.  
*Astragalinus tristis*, 20, 51, 80, 284,  
 404, 433.  
*tristis pallidus*, 404.  
*Asturina nitida*, 288, 290.  
*Athene noctua*, 192.  
*Atthis caliope*, 312.  
*Attila citreopygia citreopygia*, 303.  
*citreopygia luteola*, 303.  
 Audubon, John James, letters of, to  
 Spencer F. Baird, 53-70; notes  
 on the ornithological works of,  
 226; his 'Ornithological Biog-  
 raphy,' 349.  
 Audubon Societies, National Asso-  
 ciation of, second annual meeting,  
 120.  
 Auk, Little, 186.  
 Australian Ornithologists' Union,  
 sixth annual session of, 240.  
*Automolus ercetus*, 299.  
*pallidigularis*, 287.  
*virgatus*, 299.  
*Avis Marylandica Gutture Luteo*,  
 448.

Avocet, American, 253, 413, 414, 415, 416, 424.

Aythya, 190.  
affinis, 9, 49, 158, 249, 320, 422.  
americana, 158, 249, 320, 422.  
collaris, 139, 320.  
marila, 320, 422.  
vallisnaria, 139, 158, 320, 422.

BÆOLOPHUS bicolor, 25, 285, 435.

Bailey, H. H., Mortality among Kingfishers, 439.

Baird, Spencer F., letters of, to John James Audubon, 53-70.

Baldpate, 248, 318, 386, 414, 417, 421.

Baldwin, Roger N., a Woodcock nesting in St. Louis, Mo., 339.

Bangs, Outram, on a collection of birds from western Costa Rica, 287-312; notice of his review of the Wood Rails (genus *Aramus*) occurring north of Panama, 359; notice of his 'Notes on Birds from Costa Rica and Chiriquí,' 453. See also Thayer, John E.

Bartramia longicauda, 254, 427.

Basileuterus rufifrons delattrii, 306.  
semicervinus veraguensis, 306.  
veraguensis, 287.

Bec-scie, 317.

Bec-scie de mer, 317.

Beebe, C. William, notes on the early life of Loon Chicks, 34-41; notice of his 'The Bird, Its Form and Function,' 112; notice of his 'Owls of the Nearctic Region,' 362.

Bent, A. C., the Marbled Godwit on its breeding grounds, 160-167; Whistling Swan (*Olor columbianus*) in Massachusetts, 212; the American Rough-legged Hawk breeding in North Dakota, 213; summer birds of southwestern Saskatchewan, 407-430.

Berlepsch, Hans Graf von, notice of 'Descriptions of New Species and Subspecies of Neotropical Birds,' 359; notice of his 'Studien über Tyranniden,' 360; notice of his 'On the Genus *Elania* Sundev.' 360.

Berlepsch, Hans Graf von, and Jean Stolzmann, notice of their 'Rapport sur les nouvelles Collections ornithologiques faites au Pérou par M. Jean Kalinowski,' 361.

Beyer, Geo. E., Andrew Allison, and Henry H. Kopman, list of birds of Louisiana, Part III, 314-321.

Bigelow, Henry B., on hybrids between the Mallard (*Anas boschas*) and certain other Ducks, 382-388.

Bird, Man-o'-War, 317.

Bittern, American, 7, 11, 49, 251, 414, 416, 423.

Cory's, 338.

Least, 2, 7, 11.

Blackbird, Brewer's, 88, 400, 412.  
Red-winged, 8, 11, 19, 51, 78, 172, 174, 180, 284, 332-336, 397, 416, 433.  
Rusty, 51, 123, 400.  
Yellow-headed, 78, 100, 397, 414, 416.

Blackwelder, Eliot, notice of his Report on Birds observed in China, 453.

Blake, Francis G., the nesting of *Stelgidopteryx serripennis* in Norwich, Vt., 103; a New Hampshire record for *Stelgidopteryx serripennis*, 104.

Blake, Francis G. and Maurice C., Baird's Sandpiper at Newfound Lake, Hebron, N. H., 94.

Blake, Maurice C., notes from western New York, 224. See also Blake, Francis G.

Blandford, William Thomas, biographical notice of, 118.

Blatchley, W. S., the Brown Pelican in Indiana, 337.

Bluebird, 25, 52, 87, 173, 175, 178, 179, 285, 435.  
  Mountain, 245.

Bobolink, 19, 78, 178.

Bob-white, 16, 58, 71, 174, 283, 432.

Bombycilla, 362.

Bonasa, 198.  
  umbellus togata, 71.

Booby, 316.

Botaurus, 195.  
  lentiginosus, 7, 11, 49, 251, 423.

Braislins, William C., notes concerning certain birds of Long Island, New York, 186-189; a correction: concerning the occurrence of *Numenius borealis* on Long Island, 341.

Brancher, 320.

Branta bernicla, 321.  
  canadensis, 49, 250, 283, 321, 423.  
  canadensis hutchinsii, 251, 321.

Brant, 321.

Brewster, William, concerning certain supposed instances of the occurrence of the Cinnamon Teal in Florida and South Carolina, 154-157; notes on the Black Rail of California, 205-210; aggressive Screech Owls, 215; breeding of the Rough-winged Swallow in Berkshire County, Mass., 221.

Brimley, H. H., White-winged Crossbill at Raleigh, N. C., 220.

British Ornithologists' Club, notice of report of a Committee of on the Immigration of Summer Residents in the Spring of 1906, 357.

Broek, Henry H., recent occurrence of the European Teal and the Marbled Godwit near Portland, Maine, 94.

Brooks, Allan, a hybrid Grouse, Richardson's + Sharp-tail, 167-169.

Brooks, Winthrop S., the Stilt Sandpiper in Massachusetts, 437.

Brotogeris jugularis, 292.

Brown, Frank A., a Florida Gallinule on the coast of Massachusetts, 97.

Brown, Nathan Clifford, note on the Clapper Rail in Maine, 95; the Raven near Portland, Maine, 100;

Brownson, W. H., Connecticut Warbler in Maine, 105.

Buarremon assimilis, 310.  
  costaricensis, 288, 310.

Bubo virginianus, 50, 74.  
  virginianus pallescens, 268.  
  virginianus saturatus, 75.  
  virginianus subarcticus, 75.

Bucco dysoni, 293.

Buffelhead, 321.

Buller, Walter Lawry, biographical notice of, 119.

Bunting, Indigo, 21, 81, 173, 174, 176, 178, 181, 323, 431, 433.  
  Lark, 409, 410.  
  Lazuli, 245.  
  Painted, 173, 174, 180.  
  Slate-colored, 279.  
  Yellow-breasted, 279.

Buteo borealis, 17, 72, 283, 429, 432.  
  borealis calurus, 72, 262.  
  borealis harlani, 262.  
  lineatus, 72, 432.  
  swainsonii, 72, 262, 429.  
  platypterus, 17, 72.

Butorides virescens, 8, 11, 16, 432.  
  virescens maculata, 289.

Buzzard, Turkey, 174.

CASICUS microrhynchus, 308.

Calcarius lapponicus, 80, 126, 223, 370, 405.  
  ornatus, 405.

Calcarius pictus, 126.  
Calidris, 195.  
arenaria, 426.  
California Academy of Science's Expedition to Galapagos Archipelago, return of, 240.  
Calliope calliope, 278.  
Callipepla squamata, 344.  
Calospiza guttata chrysophrys, 308.  
gyroloides, 308.  
larvata fanny, 308.  
Calypte anna, 313.  
costæ, 313.  
Cameron, E. S., the birds of Custer and Dawson Counties, Montana, 241-270, 389-406.  
Campophilus guatemalensis buxans, 293.  
Camptolaimus, 191.  
Campostoma pusilla flaviventre, 301.  
Canachites canadensis canace, 87.  
Canard cheval, 320.  
français, 318.  
gris, 319.  
noir, 320.  
Caprimulgus carolinensis, 196.  
Capsiempis flaveola, 287.  
Cardinal, 21, 81, 128, 146, 170, 171, 172, 173, 174, 285, 431, 433.  
Cardinalis cardinalis, 21, 81, 128, 146, 285, 433.  
Carpodacus, 199.  
erythrinus grebnitzkii, 279.  
mexicanus, 107.  
mexicanus rhodocolpus, 107.  
purpureus, 19, 79, 124, 144, 284.  
Carduelis, 199.  
carduelis, 79.  
Carpenter, F. W., telescope observations of migrating birds, 107.  
Casmorinchos, 451.  
Cassinia, a Bird Annual, see Delaware Valley Orn. Club.  
Catbird, 14, 24, 85, 175, 176, 178, 181, 412, 435.  
Catharista urubu, 17.  
Cathartes, 198.  
aura, 17, 72, 259, 283, 428, 432.  
Catharus griseiceps, 288, 304.  
melpomone costaricensis, 304.  
Catoptrophorus semipalmatus, 288, 291.  
Certhneis sparveria, 290.  
Cercomacra tyrannina crepera, 296.  
Centrocercus phasianus, 258.  
urophasianus, 428.  
Centurus carolinus, 18, 76, 284, 433.  
tricolor, 286.  
Ceophloeus, 197.  
lineatus, 293.  
pileatus, 18, 50, 270.  
pileatus abieticola, 76, 432.  
scapularis, 293.  
Certhia familiaris americana, 52, 86, 225, 285, 435.  
Ceryle aleyon, 17, 50, 75, 269, 432.  
amazona, 294.  
americana septentrionalis, 294.  
torquata torquata, 294.  
Chæmepella, 192.  
minuta, 288, 392.  
rufipennis rufipennis, 392.  
Chætura pelagica, 18, 50, 76, 423.  
Chamæthlypis caninucha, 306.  
Chapin, James, capture of Lawrence's Warbler on Staten Island, N. Y., 343.  
Chapman, Frank M., the eastern forms of *Geothlypis trichas*, 30-34; notice of his 'The Warblers of North America,' 227-229.  
Charadrius dominicus, 141, 223, 255.  
Charitonetta albeola, 250, 321, 422.  
Chasmorhynchus, 451.  
tricarunculatus, 303.  
Chat, Yellow-breasted, 24, 88, 173, 174, 329, 331, 434.  
Chaulelasmus streperus, 139, 248, 318, 421.  
Chen cæruleocephala, 321.  
hyperborea, 139, 250, 321.

Chen hyperborea nivea, 321.  
*rossii*, 211, 250.

Chewink, 189.

Chickadee, Black-capped, 52, 86.  
*Carolina*, 25, 170, 172, 174, 435.  
*Hudsonian*, 86, 107, 128.  
*Long-tailed*, 243, 245.

Chiroxiphia linearis, 303.

Chloroerysa fulgentissima, 361.  
*hedwigae*, 361.

Chlorophanes spiza exsul, 306.

Chlorostilbon assimilis, 295.

Chondestes grammacus, 20, 80.

Chordeiles virginianus, 18.  
*virginianus henryi*, 389.

Chrysocantor aestiva aestiva, 306.

Chuck-wills-widow, 14, 18, 58, 179.

Cinclus ardesiacus, 105.  
*mexicanus*, 105.

Circus hudsonius, 72, 259, 428.

Cistothorus palustris, 52.  
*stellaris*, 85.

Clark, Austin H., characteristic  
 Kamchatkan birds, 278-280; no-  
 tice of his 'Eighteen new species  
 and one new Genus of Birds from  
 Eastern Asia and the Aleutian  
 Islands,' 453.

Clarke, Hubert Lyman, notice of  
 his 'The Birds of Amherst and  
 Vicinity,' 236.

Clarke, Wm. Eagle, notice of his  
 'On the Birds of the Weddell  
 and adjacent Antarctic Seas,' 454.

Clais guimeti, 296.

Clangula, 191.  
*claugula americana*, 249, 320.

Claravis pretiosa pretiosa, 292.

Coccothraustes vespertinus, 107.  
*vespertinus montanus*, 401.

Coccyzus americanus, 17, 75, 432.  
*erythrophthalmus*, 75, 269.  
*minor minor*, 292.

Celigena, 196.

Cereba mexicana, 308.

Colaptes auratus, 18, 50, 270.

Colaptes auratus luteus, 76, 284,  
 433.  
*ayresii*, 66.  
*cafer collaris*, 270.  
*hybridus*, 66.

Cole, Leon J., notice of his 'Verte-  
 brata from Yucatan,' 237

Colibri delphinæ, 296.

Colinus virginianus, 17, 50, 71, 76,  
 283, 432.

Columba carunculata, 192.  
*nigrirostris*, 292.  
*passerina*, 192.  
*rufina*, 291.  
*speciosa*, 291.

Columbigallina, 192.

Colymbus, 190, 199.  
*arcticus*, 199.  
*auritus*, 314, 377, 419.  
*cristatus*, 190.  
*holbællii*, 419.  
*nigricollis ruficollis*, 247.  
*nigricollis californicus*, 419.  
*ruficollis*, 190.

Compsothlypis americana ramelinæ,  
 22, 329, 434.  
*americana usneæ*, 51, 83.

Contopus, 192, 451.  
*richardsonii*, 392.  
*virens*, 19, 50, 433.

Conuropsis, 198.

Conurus, 198.  
*carolinensis*, 198.  
*gianensis*, 198.

Cooke, Wells W., notice of his 'Dis-  
 tribution and Migration of Ducks,  
 Geese, and Swans,' 232; many  
 eyes are better than one pair, 346-  
 348.

Coot, American, 2, 8, 11, 16, 252,  
 283, 414, 416, 424, 436.

Cormorant, Double-crested, 137,  
 247, 316, 415, 420.  
*Florida*, 316.  
*Mexican*, 317.

Coropipo leucorrhœa altera, 303.

Corvus americanus, 393.  
brachyrhynchos, 19, 51, 78,  
284, 433.  
corax kamtschaticus, 280.  
corax principalis, 50, 76, 100.  
corax sinuatus, 393.  
corone orientalis, 280.  
cryptoleucus, 393.  
Coturniculus, 193.  
savannarum passerinus, 80, 145,  
433.  
Cowbird, 173, 174, 396.  
Crane, Little Brown, 251, 423.  
Sandhill, 251, 424.  
Whooping, 58, 88.  
Crax panamensis, 290.  
Creeper, Brown, 52, 86, 109, 181,  
225, 285, 435.  
Crossbill, American, 51, 79, 107, 125,  
220, 243, 402, 413, 439.  
Bendire, 271, 278, 440.  
Mexican, 101.  
White-winged, 79, 101, 107,  
125, 145, 220, 349, 442.  
Crow, American, 19, 51, 78, 174,  
284, 393, 433.  
Fish, 174.  
Kamehatkan Carrion, 280.  
Crymophilus, 196.  
Cryptoglaux acadica, 74.  
tengmalmi richardsoni, 74, 111.  
Crypturus soui modestus, 290.  
Cuckoo, Black-billed, 75, 246, 269.  
Eastern, 279.  
Yellow-billed, 17, 75, 170, 172,  
173, 174, 432.  
Cuculus canorus telephonus, 279.  
Curlew, Hudsonian, 341.  
Long-billed, 409, 415, 427.  
Cyanecula, 193.  
Cyanerpes cyaneus, 306.  
lucidus, 307.  
lucidus **isthmicus**, 288, 306.  
Cynocephalus cyanocephalus, 394.  
Cyanocitta cristata, 19, 50, 77, 284,  
433.

Cyanocompsa concreta cyanescens,  
311.  
**Cyanolæmus**, 196.  
Cyanospiza, 199.  
cyanea, 21, 81, 323, 433.  
Cyanosylvia, 193.  
Cyclorrhynchus, 197.  
Cynanthus, 192.  
latirostris, 192.  
  
DACNIS cayana callaina, 308.  
venusta, 308.  
Dafila acuta, 249, 282, 319, 384, 422.  
Daggett, Frank S., the Whistling  
Swan in northeastern Illinois, 337;  
Petivers' Gazophylacium, 448.  
Dame, Alfred M., a new White-  
throat song, 102.  
Daption capensis, 454.  
Davenport, Mrs. Elizabeth B., notice  
of her 'Birds of Bennington and  
Windham Counties, Vermont,'  
456.  
Deane, Ruthven, unpublished let-  
ters of John James Audubon and  
Spencer F. Baird, 53-70; Audu-  
bon's Ornithological Biography,  
111; unusual abundance of the  
American Goshawk (*Accipiter atric-  
apillus*), 182-186; Great Gray  
Owl (*Scotaptes nebulosa*), 215;  
Great Gray Owl (*Scotaptes nebu-  
losa*) in Rhode Island, 215; the  
Snowy Owl (*Nyctea nyctea*) not  
generally abundant in the win-  
ter of 1906-1907, 217; Ameri-  
can Hawk Owl (*Surnia ulula  
caparoch*) in Rhode Island, 219.  
Delaware Valley Ornithological  
Club, notice of 'Proceedings' for  
1906, 237.  
Dendragapus canadensis, 49.  
obscurus richardsonii, 167.  
Dendrobates ceciliæ, 287.  
Dendrocichla anabatina anabatina,  
299.

Dendrocolaptes sancti-thomæ, 300.  
*sancti-thomæ hesperius*, 288, 298.  
 Dendrocops sancti-thomæ, 300.  
 Dendrocygna fulva, 321.  
 Dendroica aestiva, 23, 52, 83, 329, 434.  
*blackburniæ*, 23, 52, 84, 330.  
*cærulescens*, 23, 52, 83, 330.  
*castanea*, 23, 84, 330.  
*cerulea*, 84, 225, 329, 361, 434, 446.  
*coronata*, 23, 83, 285, 330.  
*discolor*, 24, 84.  
*kirtlandi*, 84.  
*maculosa*, 23, 52, 84, 330.  
*palmarum*, 23, 84, 225, 330.  
*pensylvanica*, 23, 84, 306, 329, 361.  
*rara*, 361.  
*striata*, 23, 84, 146, 330, 380.  
*tigrina*, 22, 52, 83, 330, 446.  
*vigorsii*, 23, 52, 84, 225, 349.  
*virens*, 23, 52, 84, 330.  
 Dendroornis lachrymosa *eximia*, 299.  
*nana costaricensis*, 299.  
 Dickcissel, 173, 174, 180, 433.  
 Dionne, C. E., notice of his 'Les Oiseaux de la Province de Québec,' 236.  
 Dolichonyx oryzivorus, 19, 78.  
 Dos-gris, 320.  
*de mer*, 320.  
 Douglass, Thomas Henry, biographical notice of, 366.  
 Dove, Mourning, 17, 72, 174, 189, 242, 259, 283, 428, 432.  
 Dovekie, 186.  
 Dowitcher, Long-billed, 425.  
 Dromococcyx phasianellus, 292.  
 Dryobates borealis, 18, 159, 349.  
*nuttalli*, 68.  
*pubescens*, 18, 50.  
*pubescens medianus*, 75, 284, 432.  
*pubescens oreocæcus*, 270.  
*villosus*, 50, 75, 270, 284, 432.  
 Dryobates villosus *audubonii*, 17.  
 Dryotomus, 197.  
 Duck, American Golden-eye, 249.  
*American Scaup*, 320, 417.  
*Black*, 318, 320, 382.  
*Bufflehead*, 250, 321, 422.  
*Canvas-back*, 139, 158, 320, 414, 416, 422.  
*Florida*, 318.  
*French*, 318.  
*Fulvous Tree*, 321.  
*Lesser Scaup*, 9, 49, 158, 249, 320, 417, 422.  
*Redhead*, 158, 249, 320.  
*Red-legged*, 138.  
*Ring-necked*, 139, 320, 417.  
*Ruddy*, 158, 249, 321, 414, 416, 423.  
*Scaup*, 422.  
*Wood*, 320, 431.  
 Dumetella, 193.  
*felivox*, 193.  
 Dysporus, 194.  
 EAGLE, Bald, 17, 49, 174, 232, 265, 283.  
*Golden*, 73, 232, 243, 244, 264, 429.  
*Gray Sea*, 232.  
*Kamchatkan Sea*, 280.  
*Northern Bald*, 73, 429.  
*Ectopistes migratorius*, 71.  
*Egretta candidissima*, 436.  
*Eider*, American, 250.  
 Eifrig, G., Scarlet Tanager (*Piranga erythromelas*) at Ottawa, Canada, 103; early appearance of certain northern species at Ottawa, Canada, 110; American Goshawk (*Accipiter atricapillus*) versus Man and Barred Owl, 437.  
 Elænia, 360.  
 Elainea albivertex, 302.  
*chiriquensis*, 301.  
*flavogastra subpagana*, 301.  
*sordidata*, 301.

Elanoides forficatus, 17, 87.  
furcatus, 290.

Elvira chionura, 296.

Emberiza variabilis, 453.

Emberizoides macrourus hypochondriacus, 309.  
sphenura, 310.  
sphenura hypochondriacus, 288, 309.

Embody, G. C., Bachman's Warbler breeding in Logan County, Kentucky, 41, 42.

Empidonax canescens, 99.  
flaviventris, 19, 50, 77, 144, 302, 328.  
griseus, 99.  
hammondi, 392.  
minimus, 19, 50, 77, 392.  
pusillus traillii, 361.  
sp., 433.  
traillii, 19, 392.  
.traillii alnorum, 77, 302, 349.  
traillii traillii, 302.  
virescens, 19, 87, 99.

Ereunetes pusillus, 253, 426.  
occidentalis, 288, 291.

Erismatura jamaicensis, 158, 321, 423.  
rubida, 250.

Estabrook, A. H., the present status of the English Sparrow problem in America, 129-134.

Eucometis spodocephala, 309.  
spodocephala stictothorax, 288, 309.

Eumomota supercilialis australis, 294.

Euphagus carolinus, 51, 78, 123.  
cyanocephalus, 88.

Euphonia crassirostris, 308.  
gracilis, 308.  
leuteicapilla, 308.  
minuta humilis, 308.

FALCO columbarius, 73, 214, 266.  
islandus, 73.

Falco lagopus, 195.  
mexicanus, 244, 265, 429.  
peregrinus anatum, 73, 244, 266.  
richardsoni, 267, 429.  
sparverius, 49, 73, 283, 429, 432.  
sparverius phalœna, 267.

Falcon, Prairie, 243, 244, 265, 429.

Faxon, Walter, additional notes on the Brewster's Warbler in the Arnold Arboretum, Jamaica Plain, Mass., 444; *Helminthophila leucobronchialis* (Brewst.) in Lexington, Mass., 444; a Mockingbird (*Mimus polyglottos*) in Lexington, Mass., in winter and summer, 446.

Felger, A. H., a card system of note-keeping, 200-205; Ross's Snow Goose in Colorado, 211; the Prothonotary Warbler in Colorado, 342.

Ferry, John F., ornithological conditions in northeastern Illinois, with notes on some winter birds, 121-129; winter bird notes from extreme southern Illinois, 281-286; further notes from extreme southern Illinois, 430-435.

Field, Herbert Haviland, the *Councilum Bibliographicum* as a Bureau of Ornithological Information, 117.

Finch, Pine, 80, 107.  
Purple, 19, 51, 79, 124, 144, 181, 284.

Fleming, James H., birds of Toronto, Canada. Part II, Land Birds, 71-89; notice of his 'The Disappearance of the Passenger Pigeon,' 357; notice of his 'The Unusual Migration of Brünnich's Murre (*Uria lomvia*) in eastern North America,' 364.

Flicker, Golden-winged, 18, 108, 174, 270.

Flicker, Hybrid, 411.  
 Northern, 50, 76, 284, 433.  
 Red-shafted, 270.

Floricola superba, 296.

Florida cærulea, 338.

Florisuga mellivora, 295.

Flycatcher, Acadian, 87.  
 Alder, 77, 181, 413.  
 Crested, 18, 76, 170, 171, 174, 175, 180.  
 Great-crested, 433.  
 Green-crested, 19, 99, 170, 171, 174, 180.  
 Hammond's, 392.  
 Least, 19, 50, 77, 181, 392, 412.  
 Olive-sided, 50, 77, 224.  
 Traill's, 19, 349, 392.  
 Wright's, 413.  
 Yellow-bellied, 19, 50, 77, 144, 224, 328.

Forbes, S. A., notice of his 'An Ornithological Cross-section of Illinois in Autumn,' 358.

Forbush, Edward Howe, notice of his 'Useful Birds and their Protection,' 234.

Formicarius hoffmanni hoffmanni, 298.  
 nigrifrons, 298.

Formicivora boucardi, 296.

Fregata, 195.  
 aquila, 316, 365.

Fringilla cannabina, 199.  
 carduelis, 199.  
 linaria, 199.  
 macroura, 309.  
 rosea, 199.

Fuertes, Louis Agassiz, the Glossy Ibis in central New York, 338.

Fulica americana, 2, 8, 11, 17, 252, 283, 424, 436.

Fuligula, 191.

GADWALL, 138, 248, 414, 417, 421.

Galbula melanogenia, 293.

Galeoscoptes, 193, 451.

Galeoscoptes carolinensis, 24, 85, 435.

Gallinago, 190.  
 delicata, 95, 253, 425.  
 media, 191.

Gallinula galeata, 1, 4-6, 9-11, 97.

Gallinule, Florida, 1, 4-6, 9-11, 97.

Gannet, 316.

Gavia imber, 34-41, 49, 158, 314.

Gelochelidon nilotica, 137, 315.

Geothlypis agilis, 85, 105, 222, 225.  
 formosa, 24.  
 macgillivrayi, 344.  
 philadelphiana, 85, 328, 330.  
 trichas, 30.  
 trichas brachidaetyla, 24, 33, 52, 85, 329, 434.  
 trichas ignota, 30, 32.  
 trichas trichas, 33.

Geranospizias niger, 290.

Glaucidium, 192.  
 gnoma, 269.

Glaucionetta, 191.

Glaucus hirsuta æneus, 288, 295.

Glyphorhynchus cuneatus, 299.

Gnatcatcher, Blue-gray, 25, 86, 170, 174, 222, 226, 381, 435, 447.

Godman, F. DuCane, see Salvin, Osbert.

Godwit, Hudsonian, 253, 426.

Marbled, 94, 160-167, 415, 416, 426.

Goeldi, Emilio A., notice of his 'Album de Aves Amazonicas,' 455.

Golden-eye, American, 320.

Goldfinch, American, 14, 20, 51, 80, 284, 404, 433.  
 European, 79.  
 Western, 404.

Goose, Blue, 321.  
 Canada, 49, 58, 250, 321, 423.  
 Greater Snow, 321.  
 Hutchins's 58, 251, 321.  
 Lesser Snow, 139, 250, 321.  
 Ross's Snow, 211, 250.  
 Snow, 58.

Goose, White-fronted, 321.  
Goshawk, American, 72, 110, 142,  
182-186, 187, 214, 260-262,  
437.  
Grackle, Boat-tailed, 172, 174, 180.  
    Bronzed, 19, 51, 78, 401, 433.  
    Florida, 170, 174, 180.  
    Purple, 180.  
    Rusty, 78, 109.  
Grallaria lizanoi, 298.  
Granger, Helen, the breeding of  
Brewster's Warbler near Boston,  
Mass., 343.  
Grebe, American Eared, 247, 414,  
416, 419.  
    Holbæll's, 419.  
    Horned, 314, 377, 416, 419.  
    Pied-billed, 3, 11, 247, 314.  
    Western, 414, 416, 419.  
Grosbeak, Evening, 78, 124, 144.  
    Pine, 79, 107, 111, 124.  
    Rose-breasted, 21, 81, 176, 177,  
221, 442.  
    Western Evening, 401.  
Grouse, Canada, 49.  
    Canadian Ruffed, 71.  
    Canadian Spruce, 87.  
    Hybrid, 167-169.  
    Prairie Sharp-tailed, 256-258,  
410, 428.  
    Richardson's, 167-169.  
    Sage, 243, 258, 428.  
    Sharp-tailed, 167-169, 243.  
Grus americana, 88.  
    canadensis, 251, 423.  
    mexicana, 251, 423.  
Guara alba, 159.  
Gull, American Herring, 247.  
    Black-backed, 280.  
    Bonaparte's, 247, 313.  
    California, 413, 415, 419.  
    Franklin's, 313, 413, 416, 419.  
    Glaucus, 94.  
    Herring, 49, 233, 313.  
    Iceland, 223.  
    Laughing, 40, 313.  
Gull, Ring-billed, 136, 247, 313, 413,  
415, 419.  
    Sabine's, 247.  
    Slaty-backed, 280.  
Gymnichla nudiceps, 287.  
    nudiceps *erratilis*, 288, 297.  
Gymnopithys bicolor olivascens,  
296.  
Gypagus, 198.  
Gyrfalcon, White, 73.  
HALLETTUS albicilla, 232.  
    leucocephalus, 17, 49, 232, 265,  
283.  
    leucocephalus alascanus, 73,  
429, 429.  
Halobæna cærulea, 454.  
Harelda, 191.  
    hyemalis, 321.  
Harlow, Richard C., unusual occur-  
rence of the Short-eared Owl in  
Pennsylvania, 438.  
Hartert, Ernest, notice of his 'Die  
Vögel der Paläaretischen Fauna,'  
Heft IV, 362.  
Harvie-Brown, J. A., notice of his  
'A Fauna of the Tay Basin,' 115.  
Hawk, American Rough-legged, 73,  
213, 263.  
    American Sparrow, 14, 49, 73,  
430.  
    Broad-winged, 17, 73, 179.  
    Cooper's, 17, 49, 72, 180, 260,  
283, 432.  
    Desert Sparrow, 267.  
Duck, 73, 224, 243, 244, 266.  
Florida Red-shouldered, 174.  
Harlan's, 262.  
Harris's, 58.  
Marsh, 72, 259, 414, 428.  
Pigeon, 73, 214, 266.  
Red-shouldered, 14, 72, 432.  
Red-tailed, 17, 72, 283, 429,  
432.  
Sharp-shinned, 17, 49, 72, 174,  
180, 260, 428.

Hawk, Sparrow, 283, 411, 432.  
 Swainson's, 72, 262, 411, 429.  
 Western Red-tail, 72, 262.

Hazard, R. G., the Great Carolina Wren in southern Rhode Island, 446.

Heleodytes capistratus capistratus, 304.

Helinaia swainsonii, 45.

Heliothrix barroti, 296.

Hellmayr, C. E., notice of his 'Revision der Spix'schen Typen brasilianische Vögel,' 113; notice of his 'Critical Notes on the Types of Little-known Species of Neotropical Birds,' 231; notice of his 'Notes on a second collection of Birds from the District of Pará, Brazil,' 231.

Helminthophila, 193.  
 bachmani, 41-48, 159, 348, 378.  
 celata, 83, 328.  
 celata oreastera, 379.  
 chrysoptera, 88, 224, 329, 444.  
 lawrencei, 342, 343.  
 leucobronchialis, 343, 443, 444.  
 peregrina, 83, 224, 328, 348.  
 pinus, 22, 224, 328, 443, 445.  
 ruficapilla, 51.  
 rubricapilla, 83, 329.  
 virginiae, 344.

Helmitherus vermiculus, 22.

Helodromas solitarius, 95, 254, 426, 432.  
 solitarius cinnamomeus, 426.

Hen, Prairie, 87.

Henderson, Junius, nesting of Crossbills in Colorado, 440.

Henicorhina pittieri, 287.  
 prosthelaea pittieri, 305.

Henninger, W. F., two birds new for Ohio (*Oceanites oceanicus* and *Merula migratoria achruslera*), 447.

Herman, Otto, notice of his 'The International Convention for the Protection of Birds,' etc., 456.

Heron, Black-crowned Night, 140, 432.  
 Great Blue, 16, 49, 58, 251, 423, 431.  
 Great White, 58.  
 Green, 8, 16, 432.  
 Little Blue, 139, 338.  
 Snowy, 436.  
 Yellow-crowned, 187, 377.

Hesperiphona vespertina, 78, 124, 144.

Heteractitis inceanus, 340.

Higbee, H. G., the Blue-gray Gnatcatcher in Massachusetts, 222; an intergrade between *Helminthophila pinus* and *H. leucobronchialis* captured in Hyde Park, Mass., 443.

Himantopus mexicanus, 344.

Hirundo erythrogaster, 21, 51, 82.

Hodoiporus, 194.

Horizopus, 192.

Horizopus richardsonii sordidus, 302.  
 vires, 77.

Hortulanus, 193.  
 albicollis, 193.  
 erythrophthalmus, 193.  
 nigricollis, 193.

House-finches, Siberian, 279.

Howell, Arthur H., and Henry Oldys, the Bewick Wren in the District of Columbia, with a description of its song, 149-153; another Connecticut Warbler from Maine, 222.

Hubel, Frederick C., preliminary list of the summer birds of the Cobalt Mining Region, Nipissing District, Ontario, 48-52.

Hummingbird, Hybrid, 312.  
 Broad-tailed, 313.  
 Calliope, 390.  
 Ruby-throated, 18, 50, 76, 174, 180, 390, 433, 448.

Hydrochelidon nigra surinamensis, 211, 247, 315, 420.

**Hylobrontes**, 198.  
**Hylocharis eliciæ**, 295.  
**Hylocichla aliciæ**, 25, 86.  
    aliciæ bicknelli, 88.  
    aonalaschkæ, 344.  
    aonalaschkæ pallasii, 188.  
    fuscescens, 25, 52, 86.  
    fuscescens salicicola, 88.  
    guttata pallasii, 25, 86, 226.  
    mustelina, 25, 86, 435.  
    swainsoni, 361.  
    ustulata swainsonii, 25, 86.  
**Hylophilus viridiflavus**, 287.  
**Hypocentor aureolus**, 279.

**IACHE**, 192.  
**Ibis**, Glossy, 338.  
    Scarlet, 58.  
    White, 159.  
**Icteria virens**, 24, 88, 306, 329, 434.  
**Icterus bullocki**, 400.  
    galbula, 19, 78, 433.  
    spurius, 19, 78, 308, 433.  
**Idioptilon**, 359.  
    rothschildi, 359.  
**International Ornithological Congress**, Proceedings of the Fourth, noticed, 352-354.  
**International Zoölogical Congress**, Seventh, proposed Ornithological Section of, 239; meeting of, 462-466.  
**Iridoprogne albilineata**, 305.  
    bicolor, 21, 51, 82.  
**Ixobrychus**, 192.

**JANNEY**, Nath. E., Audubon's Ornithological Biography, 349.  
**Jay**, Canada, 50, 77.  
    Blue, 19, 50, 77, 174, 189, 284, 433.  
    Piñon, 243, 245, 394.  
**Jourdain**, Francis C. R., notice of his 'The Eggs of European Birds,' Part II, 361.  
**Junco hyemalis**, 51, 81, 102, 284.

**Junco**, Pink-sided, 413.  
    Slate-colored, 51, 81, 102, 109, 181, 284.

**KAMPTORHYNCHUS**, 191.  
**Killdeer**, 255, 283, 413, 415, 416, 427, 432.  
**Kingbird**, 18, 50, 76, 173, 174, 177, 180, 390, 412, 433.  
    Arkansas, 242, 391, 412.  
**Kingfisher**, Belted, 17, 50, 75, 174, 269, 432, 439.  
**Kinglet**, Golden-crowned, 52, 86, 109, 110, 285.  
    Ruby-crowned, 25, 86, 108.  
**Kite**, Mississippi, 174.  
    Swallow-tailed, 17, 87, 174.  
**Kittiwake**, 337, 435.  
**Knaebel**, Ernest, a new Colorado Record for the White-winged Crossbill (*Loxia leucoptera*), 101.  
**Koch**, August, biographical notice of, 238.  
**Kopman**, Henry H., aspects of bird distribution in Louisiana and Mississippi, 169-181. See also Beyer, Geo. E.

**LAGOPUS lagopus**, 71.  
    rupestris chamberlaini, 453.  
**Lampropygia**, 196.  
**Lanius melanopygus**, 309.  
**Lanius borealis**, 82, 128, 361.  
    ludovicianus, 285, 361, 434.  
    ludovicianus migrans, 82.  
**Lark**, Horned, 77, 242, 410.  
    Desert Horned, 243, 392.  
    Prairie Horned, 77, 284, 452.  
**Larus argentatus**, 49, 233, 247, 282, 314.  
    atricilla, 314.  
    californicus, 419.  
    delawarensis, 136, 247, 282, 314, 419.  
    franklinii, 314, 419.  
    glaucus, 94.

*Larus leucopterus*, 223.  
*philadelphus*, 247.  
*ridibundus*, 280, 314.  
*schistasagus*, 280.  
*Lass*, Herbert Ravenal, notice of his 'Bird Life of a City Garden,' 364.  
*Lathria unirufa clara*, 303.  
*Legatus albicollis*, 302.  
*Leptopodion cayennensis*, 290.  
*Leptopogon pileatus*, 301.  
*pileatus faustus*, 288, 300.  
*Leptotila rufinucha*, 292.  
*verreauxi*, 292.  
*Lestris pomarinus*, 64.  
*Leucosticte tephrocotis*, 402.  
*teprocotis littoralis*, 403.  
*Leucosticte*, Gray-crowned, 402.  
*Hepburn's*, 403.  
*Limonites minutilla*, 291.  
*Limosa fedoa*, 94, 160-167, 426.  
*hämastica*, 253, 426.  
*Limpkin*, 95.  
*Linaria*, 199.  
*Linota cannabina*, 88.  
*Lobipes*, 196.  
*Longspur*, 409.  
*Lapland*, 80, 127, 223, 369, 405, 449.  
*Smith's*, 127.  
*Chestnut-collared*, 405.  
*McCown's*, 406.  
*Lönnberg*, Einar, notice of his 'Contributions to the Fauna of South Georgia. I. Taxonomic and Biological Notes on Vertebrates,' 115.  
*Loon*, 34-41, 49, 58, 158, 314.  
*Lophodytes cucullatus*, 248, 282, 317, 421.  
*Lophornis adorabilis*, 296.  
*Loxia curvirostra bendirei*, 271, 440.  
*curvirostra minor*, 51, 79, 107, 125, 214, 220, 271-278, 402, 439.  
*curvirostra stricklandi*, 101, 271.  
*Loxia leucoptera*, 79, 101, 107, 125, 145, 220, 271, 349, 442.  
*MACHETES*, 195.  
*Macrorhamphus*, 195.  
*scolopaceus*, 425.  
*Magpie*, American, 89, 243, 244, 393.  
*Kamchatkan*, 280.  
*Malacoptila panamensis panamensis*, 293.  
*Mallard*, 58, 248, 282, 317, 382, 414, 417, 421.  
*Manacus aurantiacus*, 303.  
*Man-o'-War Bird*, 317.  
*Mareca americana*, 247, 319, 386, 421.  
*Marila*, 190, 191.  
*nyroca*, 190.  
*Martin*, Purple, 21, 82, 174, 180, 433.  
*McKechnie*, F. B., notes on the ornithological works of John James Audubon, 226.  
*Meadowlark*, 78, 178, 284, 409, 433.  
*Southern*, 19, 173, 174, 179.  
*Western*, 242, 398.  
*Megascops*, 192.  
*asio*, 17.  
*asio maxwelliae*, 268.  
*Melanerpes erythrocephalus*, 18, 76, 270, 433.  
*chrysauchen*, 287, 292.  
*wagleri*, 292.  
*Melanitta*, 198.  
*Meleagris gallopavo fera*, 87.  
*gallopavo sylvestris*, 283.  
*Melospiza cinerea melodia*, 51, 81, 146, 284.  
*georgiana*, 8, 11, 21, 81, 284.  
*lincolni*, 21, 81, 224, 341.  
*Merganser*, 194.  
*americanus*, 247, 317, 420.  
*serrator*, 248, 317, 344.  
*Merganser*, American, 247, 317, 415, 420.  
*Hooded*, 248, 282, 317, 421.  
*Red-breasted*, 248, 317.

Mergus, 194.  
serrator, 194.

Merlin, Richardson's, 267, 430.

Mershon, W. B., notice of his 'The Passenger Pigeon,' 355-357.

Merula, 194, 451.  
migratoria, 25, 52, 86, 285, 447.  
migratoria acrusteria, 447.

Micrastur guerilla, 289.  
**interstes**, 289.  
zonothorax, 290.

Micropalama himantopus, 213, 339, 437.

Microtriccus semiflavus semiflavus, 303.

Miller, Richard F., the Black Tern at Philadelphia, Pa., 211; the Blue-gray Gnatcatcher in Philadelphia County, Pa., 222; the Little Blue Heron in Philadelphia County, Pa., 338; the Snowy Heron in Camden Co., N. J., 436; nesting of the Rose-breasted Grosbeak in Philadelphia Co., Pa., 442.

Mimus polyglottos, 24, 88, 285, 434, 446.

Mniotilla varia, 22, 51, 83, 329, 434.

Mockingbird, 14, 24, 88, 174, 178, 285, 434, 446.

Molothrus ater, 78, 396.

Momotus lessoni, 294.

Montgomery, Thos. H., Jr., notice of his 'The Protection of Our Native Birds,' 232; the English Sparrow in Texas, 341.

Morus, 194.

Motacilla regulus, 195.  
suecica, 193.  
troglodytes, 194.

Munson, E. L., *Ardea egretta* in New Mexico, 212.

Murphy, Robert C., a wounded Sora's long swim, 96.

Murre, Brünnich's, 364.

Muscicapa cayanensis, 62.

Muscicapa flava, 62.  
texensis, 62.  
virescens, 360.

Muscivora tyrannus, 302.

Myadestes townsendii, 245.

Myiarchus cinerascens, 219.  
cooperi, 220.  
crinitus, 18, 76, 433.  
lawrencei, 106.  
lawrencei bangsi, 288, 302.  
lawrencei olivascens, 106.  
lawrencei tresmariae, 106.  
nuttingi nuttingi, 302.

Myiobius barbatus atricauda, 302.  
xanthopygius sulphureipygius 302.

Myiochanes, 451.

Myiodynastes audax nobilis, 302.  
luteiventer, 302.

Myiopagis, 360.  
placens aceola, 301.

Myiozetetes similis superciliosus, 302.

Myrmelastes exsul occidentalis, 296.

Myrmotherula menetriesii, 296.

NANNUS, 194.

Nash, Chauncey C., the Stilt Sandpiper in Massachusetts, 339.

Nelson, E. W., *Empidonax griseus* Brewster vs. *Empidonax canescens* Salvin & Godman, 99; some corrected records, 106.

Nettion carolinensis, 248, 319, 421.  
georgium, 115.

Newton, Alfred, notice of his 'Ootheca Wolleyana,' Part IV, 354; biographical notice of, 365.

New York Zoölogical Park, 367.

Nichols, John Treadwell, the Vesper Sparrow on Long Island, N. Y., in winter, 220.

Nighthawk, 18, 50, 76, 174, 179, 242, 389, 412.

Noctua, 192.  
minor, 192.

Norton, Arthur H., two Ravens (*Corvus corax principalis*) seen at Harpswell, Maine, 100; the Kittiwake (*Rissa tridactyla*) on the coast of Maine in summer, 337; Lincoln's Sparrow (*Melospiza lincolni*) at Portland, Maine, 341; the Kittiwake and Purple Sandpiper again in Maine in summer, 435.

Numenius borealis, 341.  
    hudsonicus, 341.  
    longirostris, 254, 427.

Nuthatch, Brown-headed, 25, 349, 447.  
    Red-breasted, 25, 86, 147, 328, 381.  
    Slender-billed, 243, 245.  
    White-breasted, 25, 86, 159, 180, 285.  
    White-bellied, 435.

Nuttallornis borealis, 50, 77, 224.

Nyctanassa violacea, 377.

Nyctea nyctea, 75, 111, 143, 217, 269.

Nycticorax, 195.  
    nycticorax naevius, 140, 187, 432.

Nyctidromas albicollis, 295.

Nyroca, 190, 191.

OBERHOLSER, Harry C., notice of his paper on Birds from German and British East Africa, 230; notice of his 'The North American Eagles and their Economic Relations,' 232; a new *Agelaius* from Canada, 332-336.

Oceanites oceanicus, 447, 455.

Odontophorus castigatus, 291.

Œstrelata brevirostris, 454.

Oidemia americana, 321.  
    deglandi, 139, 321, 423.  
    perspicillata, 321.

Olbiornichus, 194.  
    hiemalis, 85.

Old-Squaw, 321.

Oldys, Henry, occurrence of a White-winged Crossbill at Oxen Hill, Md., in August, 442. See also Howell, Arthur H.

Olor buccinator, 251, 321.  
    columbianus, 139, 212, 321, 337, 423.

Oncocephalus mexicanus fraterculus, 302.

Oncostoma cinereigulare, 300.

Oporornis formosa, 306, 344-346, 434.  
    philadelphica, 306.

Oreomyias, 360.

Oriole, Baltimore, 19, 78, 174, 176, 433.  
    Bullock's, 400.  
    Orchard, 19, 78, 170, 180, 433.

Ornithomyia clemenciae, 197.  
    cæcigena, 196.

Oroscopetes montanus, 344.

Ortalis cinereiceps, 291.  
    vetula macallii, 106.  
    wagleri, 106.

Oryzoborus funereus, 311.

Osgood, Wilfrid H., identity of *Tyranula mexicana* Kaup, 219; probable breeding of the Wandering Tatler in the interior of Alaska, 340; '*Helminthophila lawrencei*' near the District of Columbia, 342.

Osprey, 280.  
    American, 74, 174.

Ossifraga gigantea, 454.

Otocoris alpestris, 77, 452.  
    alpestris arenicola, 392.  
    alpestris praticola, 77, 284, 452.

Otus, 192.  
    asio, 74.  
        choliba thompsoni, 237.

Oven-bird, 52, 83, 175, 176, 177, 329, 331.

Owl, American Barn, 74, 174, 214.  
    American Hawk, 75, 219.

Owl, American Long-eared, 74, 267.  
Arctic Horned, 75.  
Barred, 17, 74, 284, 432, 437.  
Burrowing, 243, 269, 410.  
Dusky Horned, 75.  
Florida Barred, 174.  
Florida Screech, 174.  
Great Gray, 74, 215.  
Great Horned, 50, 74, 174, 411.  
Hawk, 58, 110.  
Long-eared, 411.  
Pigmy, 269.  
Richardson's, 74, 111.  
Rocky Mountain Screech, 268.  
Saw-whet, 74, 109, 110.  
Screech, 17, 50, 215, 217.  
Short-eared, 74, 97, 243, 268, 414, 417, 438, 439.  
Siberian Hawk, 280.  
Snowy, 58, 75, 111, 143, 217, 269.  
Western Horned, 243, 268.  
*Oxyechus vociferus*, 255, 283, 427, 432.

**PACHYRHAMPHUS** *cinereiventris*, 303.  
*Pachysylvia decurtata*, 305.  
  *ochraceiceps pallidipectus*, 305.  
  *viridiflava*, 305.

Paille-en-queue, 320.  
Palmer, T. S., and R. W. Williams, Jr., notice of their Summary of Game Laws for 1906, 234.

Pandion haliaetus, 280.  
  *haliaetus carolinensis*, 74, 290.

Paroquet, Carolina, 454.

Partridge, Scaled, 344.

Parus atricapillus, 52, 86.  
  *atricapillus occidentalis*, 245.  
  *carolinensis*, 25.  
  *hudsonicus*, 86.

Passerulus princeps, 101.  
  *sandwichensis savanna*, 97.  
  *sandwichensis labradorius*, 452.

Passer domesticus, 20, 52, 80, 129-134, 341, 404.

Passerella iliaca, 81, 285.

Passerherbulus, 193.

Passerina, 199.  
  *nivalis*, 80, 127.  
  *sphenura*, 309.

Pavoncella, 195.

Peabody, P. B., the Crossbills of Northeastern Wyoming, 271-278.

Pearson, Leonard S., a recent Blue-gray Gnatcatcher (*Polioptila caerulea*) in Delaware Co., Pa., 447.

Pediceutes phasianellus campestris, 256-258, 428.  
  *phasianellus columbianus*, 167.

Pelican, American White, 247, 317, 337, 414, 415, 416, 420.  
  *Brown*, 317, 337.

Pelecanus bassanus, 194.  
  *erythrorynchos*, 247, 317, 420.  
  *fuscus*, 317, 337.

Penelope cristatus, 291.

Penthestes carolinensis, 435.  
  *hudsonicus* *hudsonicus*, 107, 128.

Perisoreus canadensis, 50, 77.

Petrel, Antarctic, 254.  
  Blue, 254.  
  Cape, 254.  
  Giant, 254.  
  Giant Silver, 254.

Petrochelidon lunifrons, 51, 244, 433.

Peuæa æstivalis bachmanii, 20, 349.

Pewee, Western Wood, 392, 413.  
  Wood, 19, 50, 77, 174, 180, 433.

**Phæonetta**, 198.

Phalacrocorax atriceps, 115.  
  *dilophus*, 137, 247, 316, 420.  
  *dilophus floridanus*, 316.  
  *mexicanus*, 317.

Phalænoptilus nuttallii, 389.

Phalarope, Northern, 252, 415, 424.  
  Wilson's, 140, 252, 413, 415, 416, 424.

Phalaropus, 196.

Phalaropus lobatus, 252, 424.  
 Phaleris, 197.  
 Pheugopedius fasciato-ventris melanogaster, 304.  
     hyperythrus, 304.  
 Philohela minor, 339.  
 Phlœtomus, 197.  
 Phœbe, 14, 18, 77, 433.  
     Say's, 244, 391.  
 Phœbetria cornicoides, 454.  
 Phœnicothraupis rubica vinacea, 309.  
 Piaya cayana thermophila, 292.  
 Pica pica hudsonica, 89, 244, 303.  
     pica kamtschatica, 280.  
 Picoides americanus, 50, 76.  
     arcticus, 50, 76.  
 Picolaptes compressus compressus, 299.  
 Picumnus olivaceus flavotinctus, 293.  
 Picus lineatus, 197.  
     nuttalli, 68.  
     pileatus, 197.  
 Pigeon, Passenger, 71, 355-357.  
 Pinicola enucleator leueura, 79, 107, 111, 124.  
 Pintail, 282, 384, 414, 415, 417, 422.  
 Pionus senilis, 292.  
 Pipastes maculatus, 280.  
 Pipilo, 193.  
     chlorurus, 344.  
     erythrophthalmus, 21, 81, 285, 433.  
     maculatus megalonyx, 344.  
 Pipit, American, 85, 178.  
     Antarctic, 115.  
     Tree, 280.  
 Pipra mentalis ignifera, 303.  
     vetulina, 303.  
 Pipromorpha assimilis dyscola, 300.  
 Piranga erythromelas, 21, 81, 103, 433.  
     rubra, 21, 82, 361.  
     testacea testacea, 309.  
 Pitangus derbianus derbianus, 302.  
 Placostomus superciliaris, 300.  
 Planesticus, 194, 451.  
     grayi casius, 304.  
     tristis cneephosa, 304.  
 Plectrophenax, 199.  
     nivalis, 107, 405.  
 Plover, American Golden, 255.  
     Black-bellied, 427.  
     Golden, 141, 223.  
     Mountain, 255.  
     Piping, 414, 428.  
     Semipalmated, 427.  
 Podasocys montana, 255.  
 Podiceps, 190, 199.  
 Podilymbus podiceps, 3, 6, 11, 314.  
 Pogonotriccus plumbeiceps, 360.  
 Polioptila caerulea, 25, 86, 222, 226, 381, 435, 447.  
     superciliaris superciliaris, 306.  
 Poecetes gramineus, 20, 51, 80, 220, 442.  
 Poor-will, 389.  
 Porzana carolina, 96, 252, 424.  
     coturniculus, 205.  
     jamaicensis, 208.  
     jamaicensis coturniculus, 205-210.  
     sharpei, 207.  
     spilonotus, 207.  
 Porter, Louis N., the breeding habits of *Empidonax virescens* in Connecticut, 99.  
 Proicella glacialoides, 454.  
 Procnias, 450.  
 Progne chalybea chalybea, 305.  
     subis, 21, 82, 433.  
 Protonotaria citrea, 88, 342, 434.  
 Psaltriparus plumbeus cecauenumerorum, 115.  
 Ptarmigan, Willow, 71.  
 Pteroglossus franzii, 293.  
 Puffinus borealis, 365.  
 Pulsatrix perspicillata, 294.  
 Pygocelis papua, 115.  
 Pygochelidon cyanoleuca, 306.  
 Querquedula, 191.

Querquedula cyanoptera, 154-157, 158, 319, 421.  
discors, 248, 289, 319, 421.

Quiscalus quiscula æneus, 19, 51, 78, 401, 433.  
purpureus, 19.

Rail, Black, 208.  
California Black, 205-210.  
Clapper, 87, 95.  
King, 95, 212.  
Sora, 96, 252.  
Virginia, 96, 252.  
Yellow, 108.

Rallus crepitans, 87, 95.  
elegans, 95, 212.  
virginianus, 8, 11, 251.

Ralph, William LeGrange, biographical notice of, 461.

Raven, American, 393.  
Kamchatkan, 280.  
Northern, 50, 100.  
White-necked, 393.

Recurvirostra americana, 253, 424.

Redhead, 249, 416, 422.

Redpoll, Common, 79, 107, 126, 242, 404.  
Greater, 79, 404.  
Hoary, 79, 403.  
Holboll's, 79, 404.  
Lesser, 188.

Redstart, American, 24, 52, 77, 85, 176, 177, 178, 181, 329, 331, 434.

Regulus, 195.  
calendula, 25, 86.  
satrapa, 52, 86, 285.

Remick, John A., capture of the Glaucous Gull (*Larus glaucus*) in Boston Harbor, Mass., 94; the Junco breeding at Wellfleet, Mass., 102.

Rhamphastos tocard, 293.

Rhamphocænus rufiventris, 296.

Rhamphocelus costaricensis, 309.

Rhoads, S. N., that Cinnamon Teal record from Florida, 435.

Rhinogryphus, 198.

Rhodinicincla rosea eximea, 306.

Rhynchophanes mccownii, 406.

Rhynchops nigra, 40, 315.

Rhynchopsitta pachyryncha, 368.

Rhyncocyclus brevirostris, 300.  
cinereiceps, 300.

Rich, Walter H., notice of his 'Feathered Game of the Northeast,' 459.

Ridgway, Robert, *Cinclus mexicanus* not a Costa Rican Bird, 105; notice of his 'Birds of North and Middle America,' Part IV, 450.

Riparia riparia, 82, 433.

Rissa tridactyla, 337, 435.

Roberts, Thomas S., a Lapland Longspur tragedy: being an account of a great destruction of these birds during a storm in southwestern Minnesota and northwestern Iowa in March, 1904, 369-376, 449.

Robin, American, 14, 25, 52, 58, 86, 108, 110, 178, 285, 412.

Rough-leg, Ferruginous, 243, 264, 411, 429.

Ruby-throat, Siberian, 278.

Rupornis ruficauda, 290.

Ruthven, Alexander G., another specimen of Cory's Bittern, 338.

SAGE, John H., Twenty-fourth Congress of the American Ornithologist's Union, 89-94.

Salpinetes obsoletus, 244.

Saltator albicollis, 287.  
magnoides intermedius, 288, 311.  
magnoides medianus, 312.  
striatipectus isthmicus, 312.

Salvin, Osbert, and F. DuCane Godman, notice of the 'Aves' of their 'Biologia Centrali-Americana,' 350-352.

Sanderling, 426.

Sandpiper, Baird's, 94, 253, 425.

Sandpiper, Bartramian, 254, 409, 427.  
 Buff-breasted, 437.  
 Least, 253, 291, 425.  
 Purple, 435.  
 Pectoral, 253, 425.  
 Semipalmated, 253, 291, 415, 426.  
 Solitary, 254, 426, 432.  
 Spotted, 16, 49, 254, 291, 413, 415, 416, 427, 432.  
 Stilt, 213, 339, 437.  
 Western, 291.  
 Western Solitary, 426.  
 White-rumped, 140, 339, 425.  
 Sapsucker, Yellow-bellied, 50, 76, 108, 110.  
 Saucerettea niveoventer, 295.  
 sophiae, 295.  
 Saunders, W. A., a migration disaster in Western Ontario, 108.  
 Sayornis, 196.  
 nigricans, 196.  
 phoebe, 18, 77, 433.  
 sayi, 244, 391.  
 Schiebel, Phil. Guido, notice of his 'Die Phylogene der Lanius Arten,' 230.  
 Sclerurus guatemalensis, 299.  
 Scolopax carolinus, 400.  
 cyanocephalus, 400.  
 Scolopax gallinago, 191.  
 limosa, 198.  
 Scoter, Black, 321.  
 Surf, 321.  
 White-winged, 139, 321, 417, 423.  
 Scotiapex nebulosa, 74, 215.  
 Seotothorus verapacis dumicola, 303.  
 Seed-eater, Rio Grande, 26-30.  
 Seiurus aurocapillus, 24, 52, 84, 306, 329.  
 motacilla, 24, 84, 328, 434.  
 noveboracensis, 52, 84, 225, 306, 330, 446.  
 Selasphorus alleni, 313.  
 floresii, 313.  
 platycereus, 313.  
 rufus, 312, 313.  
 Serrator, 194.  
 Setophaga ruticilla, 24, 52, 85, 329, 434.  
 Shoveller, 138, 249, 282, 414, 417, 422.  
 Shrike, Loggerhead, 14, 174, 179.  
 Migrant, 82, 434.  
 Northern, 82, 128, 243.  
 Shufeldt, R. W., notice of his 'On the Osteology of the Tubinares,' 365.  
 Sialia sialis, 25, 52, 285, 435.  
 Simorhynchus, 190.  
 Siskin, Pine, 126, 159, 181, 405.  
 Sitta canadensis, 25, 147, 328, 381.  
 carolinensis 25, 159, 435.  
 carolinensis aculeata, 245.  
 pusilla, 25, 349, 447.  
 Skimmer, Black, 40, 315.  
 Smyth, Ellison A., Jr., the Goshawk in Montgomery Co., Virginia, 214.  
 Snipe, Wilson's, 253, 425.  
 Snow, J. H., ten birds new to the avifauna of Kansas, 344.  
 Snowflake, 80, 107, 127, 405.  
 Snyder, W. E., late occurrence of the King Rail (*Rallus elegans*) in Wisconsin, 212.  
 Solitaire, Townsend's, 245.  
 Somateria dresseri, 250.  
 Sora, 424.  
 Sparrow, Bachman's, 20, 349.  
 Chipping, 20, 51, 81, 180, 181, 245.  
 Clay-colored, 410, 412.  
 English, 20, 52, 129-134, 243, 341, 404.  
 Field, 20, 81, 174, 180, 431, 433.  
 Fox, 81, 108, 110, 181, 284.  
 Grasshopper, 80, 174, 433.  
 House, 80.

Sparrow, Ipswich, 101.  
Lark, 20, 80, 174.  
Leconte's, 80.  
Lincoln's, 21, 81, 110, 224, 341.  
Louisiana Seaside, 172, 174.  
Macgillivray's, 102.  
Nelson's, 80.  
Savanna, 80, 97, 110, 145, 178, 181, 340.  
Song, 51, 81, 108, 146, 181, 284, 412.  
Swamp, 8, 11, 21, 81, 108, 110, 178, 181, 284.  
Tree, 81, 108, 110, 384.  
Vesper, 20, 51, 80, 181, 220, 409, 410, 442.  
Western Lark, 242.  
Western Savanna, 416.  
White-crowned, 51, 80, 108, 110, 181, 413.  
White-throated, 20, 51, 80, 102, 108, 110, 128, 178, 181, 284, 442.  
*Spatula clypeata*, 138, 249, 282, 422.  
*Speotyto cunicularia hypogaea*, 269.  
*Spermophila albicularis*, 26.  
    *moreletti*, 26.  
    *parva*, 26.  
*Sphyrapicus varius*, 50, 76.  
Spinney, Hubert L., the Stilt Sand-piper,—a correction, 213.  
*Spinus pinus*, 107, 126, 159, 405.  
*Spiza americana*, 309, 433.  
*Spizella monticola*, 81, 284.  
    *pusilla*, 20, 81, 433.  
    *socialis*, 20, 51, 81, 107.  
    *socialis arizonæ*, 107.  
*Spodesilaura*, 193.  
*Sporophila aurita*, 311.  
    *gutturalis*, 288, 311.  
    *moreletti*, 26.  
    *moreletti moreletti*, 311.  
    *moreletti sharpei*, 26-30.  
*Sprigtail*, 320.  
*Squatarola squatarola*, 427.

*Steganopus tricolor*, 140, 253, 424.  
*Stelgidopteryx ruficollis uropygialis*, 305.  
    *serripennis*, 21, 82, 103, 104, 221.  
*Stellula calliope*, 390.  
*Sterna antillarum*, 137, 315.  
    *caspia*, 137, 224, 232, 315.  
    *forsteri*, 137, 315, 420.  
    *fuliginosa*, 315.  
    *hirundinacea*, 455.  
    *hirundo*, 40, 420.  
    *maerura*, 454.  
    *maxima*, 315.  
    *paradisea*, 454.  
    *sandwichensis acuflavida*, 315.  
Stiles, Charles Wardell, on rules of nomenclature, 464.  
Stolzmann, Jean, see Berlepsch, Hans Graf von.  
Stone, Witmer, some changes in the current generic names of North American birds, 189-199.  
*Streptoprocne zonaris zonaris*, 295.  
*Strix passerinum*, 192.  
    *pratincola*, 74, 214.  
*Sturnella magna*, 78, 284, 433.  
    *magna argutula*, 19.  
    *magna neglecta*, 398.  
*Sturnus roseus*, 194.  
*Sula*, 194.  
    *bassana*, 316.  
    *sula*, 316.  
*Surnia ulula caparoch*, 75, 110, 219.  
    *ulula doliata*, 280.  
Swales, B. H., and P. A. Taverner, recent ornithological developments in southeastern Michigan, 135-148.  
Swallow, Bank, 82, 433.  
    Barn, 21, 51, 82, 177.  
    Cliff, 51, 82, 433.  
    Rough-winged, 21, 82, 103, 104, 174, 221.  
    Tree, 21, 51, 82, 176, 181.

Swan, Trumpeter, 251, 321.  
    Whistling, 139, 212, 321, 337, 423.

Swenk, Myron H., two interesting Nebraska records, 223.

Swift, Chimney, 18, 50, 76, 174, 180, 433.  
    White-throated, 390.

Sympetrum semipalmata inornata, 254, 426.

Synallaxis albescens, 287, 299.  
    albescens albicularis, 299.  
    albescens *latitabunda*, 288, 298.  
    pudica, 299.

Syrnium varium, 17, 74, 284, 432.

**TACHYBAPTUS**, 190.

Tachyphonus nitidissima, 309.

Tanager, Scarlet, 21, 81, 103, 176, 177, 181, 433.  
    Summer, 21, 81, 174, 175, 180.

Tanagra cana, 309.  
    cynaea, 199.

Tatler, Wandering, 340.

Taverner, P. A., see Swales, B. H.

Teal, Blue-winged, 154, 248, 289, 414, 417, 421.  
    Cinnamon, 154-157, 158, 417, 421, 435.  
    European, 94.  
    Green-winged, 248, 417, 421.  
    Red-breasted, 154-157.

Telmatodytes palustris, 4, 11, 85.

Terenotriccus fulvigularis, 302.

Tern, Arctic, 454.  
    Black, 211, 247, 315, 420.  
    Cabot's, 315.  
    Caspian, 137, 224, 233, 315.  
    Common, 40, 413, 414, 420.  
    Forster's, 137, 315, 414, 420.  
    Gull-billed, 137, 315.  
    Least, 137, 315.  
    Noddy, 315.  
    Royal, 315.  
    Sooty, 315.

Tetrao, 199.  
    cupido, 198.  
    tetrix, 199.  
    umbellus, 198.

Thalassœcus antarctica.

Thallossaëtus pelagicus, 280.

Thalurania colombica venusta, 296.

Thamnophilus bridgesi, 296.  
    doliatus, 296.  
    transandeanus, 296.

Thayer, Abbott H., protective coloration, 460.

Thayer, John E., the Whistling Swan at Martha's Vineyard, Mass., 212; the Barn Owl in Massachusetts, 214; the Northern Water-Thrush again nesting in Massachusetts, 446.

Thayer, John E., and Outram Bangs, notice of their 'Breeding Birds of the Sierra de Antonez, North Central Sonora,' 114; another hybrid Hummingbird — *Selasphorus rufus* + *Atthis calloptera*, 312, 313.

Thrasher, Brown, 24, 85, 175, 178, 180.  
    Sage, 344.

Threnetes ruckeri, 295.

Thrush, Alma's, 413.  
    Bicknell's, 88.  
    Dwarf Hermit, 344.  
    Gray-cheeked, 25, 86, 176.  
    Hermit, 25, 86, 109, 110, 178, 188, 226.  
    Olive-backed, 25, 86, 176, 178, 181.  
    Song, 116.  
    Willow, 88, 412.  
    Wilson's, 25, 52, 86, 176, 181, 189.  
    Wood, 25, 47, 86, 175, 180, 189, 435.

Thryomanes bewickii, 25, 149-153, 285.

Thryophilus modestus modestus, 305.

Thryophilus pleurostictus albus, 305.  
rufalbus castanonotus, 305.  
semibadius, 305.

Thryothorus ludovicianus, 25, 105, 147, 285, 435.

Tinamus castaneiceps, 290.

Tisa, 453.

Titmouse, Tufted, 25, 170, 172, 173, 174, 178, 285, 431, 435.

Tityra albitorques fraserii, 303.  
semifasciatus costaricensis, 300.

Todirostrum cinereum finitimum, 300.  
schistaceiceps, 300.

Tomineo Mariana Virescens Gutture flammeo, 448.

Totanus flavipes, 95, 254, 426.  
melanoleucus, 95, 254, 426.

Towhee, 21, 81, 173, 174, 285, 433.  
Arctic, 412.  
Green-tailed, 344.  
Spurred, 344.

Townsend, Charles W., notice of his 'Along the Labrador Coast,' 452.

Townsend, Charles W., and Glover M. Allen, notice of their 'Birds of Labrador,' 451.

Toxostoma rufum, 24, 85.

Trichas brachidactyla, 33.

Tringa fulicaria, 196.  
lobata, 196.

Tringoides, 198.  
macularius, 291.

Trochilus alexandri, 313.  
colubris, 18, 50, 390, 433, 448.  
violajugulum, 313.

Troglodites, 194.

Troglodytes aëdon, 25, 52, 85.  
intermedius, 304.  
museulus inquietus, 288, 304.

Trogon, 192.  
atricollis tenellus, 294.  
bairdi, 294.  
caligatus caligatus, 294.

Trogon massena, 294.  
melanocephalus, 294.

Tryngites subruficollis, 437.

Turdus felivox, 193.  
fuscescens, 52, 56.  
jamaicensis, 194.  
lerebouleti, 194.  
minor, 56.  
trichas, 33.

Turkey, Wild, 58, 87, 174, 180, 283.

Turnstone, Ruddy, 141.

Tympanuchus, 198.  
americanus, 87.

Tyrannicus parvus, 301.

Tyranula mexicana, 219.  
minima, 61.  
pusilla, 62.  
richardsonii, 62.  
saya, 196.

Tyrannus melancholicus satrapa, 302.  
tyrannus, 18, 50, 390, 433.  
tyrannus tyrannus, 302.  
verticalis, 391.

URIA lomvia, 364.

Urubitinga, 195.

VENIORNIS neglectus, 293.

Vermivora, 193.

Violon, 320.

Vireo flavifrons, 22, 328.  
gilvus, 83, 328.  
gilvus swainsoni, 344.  
noveboracensis, 22, 159, 434.  
olivaceus, 22, 83, 328, 434.  
philadelphicus, 22, 83, 104, 328.  
solitarius, 51, 83, 159, 329.

Vireo, Blue-headed, 51, 83, 108, 110, 159, 178, 181, 329.  
Philadelphia, 22, 83, 104, 328.  
Red-eyed, 22, 83, 108, 110, 170, 171, 174, 175, 180, 328, 434.  
Solitary, 238.  
Swainson's, 344.

Vireo, Warbling, 83, 174, 180, 328.  
 White-eyed, 22, 159, 170, 172,  
 173, 174, 175, 180, 434.  
 Yellow-throated, 22, 83, 174,  
 177, 181, 328.

Vireosylva flavoviridis flavoviridis,  
 305.  
 philadelphia, 305.

Volatinia jacarini splendens, 311.

Vultur papa, 198.

Vulture, Black, 17, 174.  
 Turkey, 17, 72, 174, 259, 283,  
 428, 432.

WAGTAIL, Kamchatkan, 280.

Warbler, Audubon's, 413.  
 Bachman's, 41-48, 159, 348,  
 378.  
 Bay-breasted, 23, 84, 176,  
 178, 330, 331.  
 Black-and-White, 22, 51, 83,  
 176, 177, 178, 329, 331, 434.  
 Blackburnian, 23, 52, 84, 176,  
 178, 181, 330, 331.  
 Black-poll, 23, 84, 146, 325  
 330, 331, 380.  
 Black-throated Blue, 23, 52, 83,  
 108, 110, 322, 325, 330, 331.  
 Black-throated Green, 23, 25,  
 84, 108, 176, 177, 178, 181,  
 330, 331.  
 Blue-winged, 22, 176, 224, 325,  
 328.  
 Brewster's, 343, 348, 444.  
 Canadian, 24, 51, 84, 330, 331.  
 Cape May, 22, 52, 83, 330, 331,  
 380, 446.  
 Cerulean, 84, 176, 181, 225,  
 329, 331, 434.  
 Chestnut-sided, 23, 84, 176,  
 177, 178, 181, 329, 331.  
 Connecticut, 85, 105, 222, 225,  
 330, 331.  
 Golden-winged, 88, 176, 224,  
 329, 331.

Warbler, Hooded, 24, 47, 88, 170,  
 172, 174, 175, 176, 178, 180,  
 434.  
 Kentucky, 24, 170, 172, 175,  
 180, 328, 344-346, 434.  
 Kirtland's, 84.  
 Lawrence's, 342, 343.  
 Macgillivray's, 344, 413.  
 Magnolia, 23, 52, 84, 176, 178,  
 330, 331.  
 Mourning, 84, 322, 328.  
 Myrtle, 23, 83, 108, 178, 285,  
 322, 330, 331.  
 Nashville, 51, 83, 320, 329, 331.  
 Northern Parula, 83.  
 Orange-crowned, 83, 178, 181,  
 328, 413.  
 Palm, 23, 84, 108, 178, 181,  
 225, 330, 331.  
 Parula, 47, 51, 170, 171, 172,  
 174, 175, 176, 178, 180.  
 Pine, 23, 52, 84, 179, 225, 348.  
 Prairie, 14, 24, 84, 181, 188.  
 Prothonotary, 47, 88, 170, 171,  
 172, 174, 175, 178, 180, 342,  
 434.  
 Rocky Mountain Orange-  
 crowned, 379.  
 Swainson's, 45, 47, 172, 174,  
 180.  
 Sycamore, 170, 171, 172, 174,  
 175.  
 Tennessee, 83, 176, 177, 178,  
 322, 329, 331, 348.  
 Virginia's, 344.  
 Western Parula, 22, 329, 331,  
 434.  
 Wilson's, 84, 328.  
 Worm-eating, 22, 177.  
 Yellow, 23, 52, 83, 174, 176,  
 178, 326, 329, 331, 412, 434.

Warbler, The, notice of, 239.  
 Ward, Henry L., notice of his  
 'Notes on the Herring Gull and  
 Caspian Tern,' 233.

Water-Thrush, 52, 84, 175, 178, 225, 330, 331.  
Louisiana, 84, 328, 434.  
Northern, 446.

Waxwing, Bohemian, 82, 107, 128, 223, 245.  
Cedar, 22, 51, 82, 246, 285.

Wayne, Arthur T., the nest and eggs of Bachman's Warbler, *Helminthophila bachmani* (Aud.), taken near Charleston, South Carolina, 43-48; another Limpkin (*Aramus giganteus*) in South Carolina, 95; the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) in Georgia, 100; an early date for the arrival of the Ipswich Sparrow (*Passerculus princeps*) on the coast of South Carolina, 101; Macgillivray's Seaside Sparrow (*Ammodramus maritimus macgillivrayi*) with fourteen rectrices, 102; the Philadelphia Vireo (*Vireo philadelphicus*) in Georgia, 104; observations on some birds procured near Charleston South Carolina, 377-381; a correction, 446.

Weber, J. A., the Buff-breasted Sandpiper (*Tryngites subruficollis*) on Long Island, 437; the Vesper Sparrow (*Poæcetes gramineus*) on Long Island, N. Y., in winter, 442.

Whip-poor-will, 14, 18, 76.

Willet, 413.  
Western, 254, 415-426.

Williams, R. W., Jr., additional notes on the birds of Leon County, Florida, 158, 159; *Loxia curvirostra minor* in Florida, 220; notice of his 'Game Commissions and Wardens,' 457.

Wilsonia canadensis, 24, 85, 330, 361.  
mitrata, 24, 88, 434.  
pusilla, 85, 328.

Wood, J. Claire, Short-eared Owl and Savanna Sparrow breeding in Wayne County, Michigan, 97; the Pigeon Hawk in Wayne Co., Michigan, 214; autumn records of Golden Plover and Lapland Longspur in Wayne Co., Michigan, 223; autumn Warbler migration, 322-331; the White-rumped Sandpiper in Michigan, 339.

Wood, Nelson R., a White-throated Sparrow in Washington, D. C., in August, 442.

Wood, Norman A., notice of his 'Twenty-five Years of Bird Migration at Ann Arbor, Michigan,' 231; the breeding of the Short-eared Owl (*Asio accipitrinus*) near Ann Arbor, Michigan, 439.

Woodcock, American, 339.

Woodpecker, American Three-toed, 50, 68.  
Arctic Three-toed, 50, 76.  
Batchelder's, 243, 270.  
Downy, 18, 50, 75, 174, 284.  
Hairy, 50, 75, 170, 243, 270, 284, 432.  
Northern Downy, 432.  
Northern Pileated, 76, 432.  
Pileated, 18, 50, 170, 174, 270.  
Red-bellied, 18, 76, 170, 174, 270, 433.  
Red-cockaded, 14, 18, 179, 349.  
Red-headed, 18, 76, 174, 270, 433.  
Southern Hairy, 17, 170, 174.  
Yellow-bellied, 76.

Woodruff, E. Semour, some interesting records from southern Missouri, 348.

Woodruff, Frank M., rare northern birds near Chicago, Ill., 107; malformed bill of Rose-breasted Grosbeak, 220; notice of his 'The Birds of the Chicago Area,' 363.

Wren, Bewick's, 25, 149-153, 178, 285.  
 Carolina, 25, 105, 147, 170, 172, 173, 174, 285, 435, 446.  
 House, 25, 52, 85, 178.  
 Long-billed Marsh, 4, 11, 52, 85, 172, 174, 178, 180.  
 Rock, 244.  
 Short-billed Marsh, 85, 178.  
 Texan Bewick, 153.  
 Western House, 411.  
 Winter, 85, 109, 110, 178.

Wright, Horace W., the Carolina Wren in Middlesex Fells, Mass., 105; a Kentucky Warbler near Boston, Mass., 344.

**XANTHOCEPHALUS xanthocephalus**, 78, 100, 397.

Xanthomyias, 360.  
 Xema sabini, 247.

YELLOW-LEGS, 254, 426.  
 Greater, 254, 426.

Yellowthroat, Florida, 172, 174, 180.  
 Maryland, 32, 448.  
 Northern, 24, 33, 85, 329, 331, 412, 431, 434.  
 Southern, 33.

ZAMELODIA ludoviciana, 21, 81, 220, 442.

Zenaidura macroura, 17, 72, 259, 283, 428, 432.

Zonotrichia albicollis, 20, 51, 80, 102, 128, 285, 442.  
 leucophrys, 51, 80.

## ERRATA.

Page 17, line 31, for **Haliaëtus** read **Haliaetus**.  
 " 111, " 14, for *leucus* read *leucus*.  
 " 133, " 24, for one grain of read one eighth ounce of.  
 " 269, " 25, for **Claucidium** read **Glaucidium**.  
 " 328, " 22, for *pusilla* read *pusilla*.  
 " 338, " 34, for *cærula* read *cærulea*.  
 " 365, " 15, for June 8, 1907, read June 7, 1907.  
 " 433, " 31, for **Coturniculus sandwichensis** *passerinus* read **Coturniculus savannarum** *passerinus*.  
 On map of Dawson Co., Montana (facing p. 244) for Scale, 12 miles = 1 inch read Scale, 18 miles = 1 inch.  
 On map of Custer Co., Montana (facing p. 244) for Scale, 12 miles = 1 inch read 19.4 miles = 1 inch.





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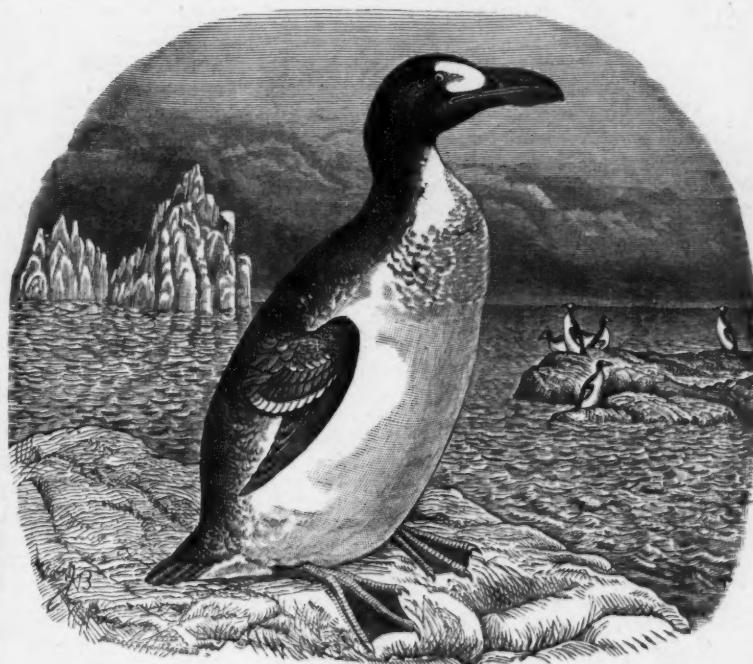
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## CONTENTS.

	PAGE
A LAPLAND LONGSPUR TRAGEDY. By Thomas S. Roberts, M. D. (Plates XIII and XIV.)	369
OBSERVATIONS ON SOME BIRDS PROCURED NEAR CHARLESTON, S. C. By Arthur T. Wayne	377
ON HYBRIDS BETWEEN THE MALLARD ( <i>Anas boschas</i> ) AND CERTAIN OTHER DUCKS. By Henry B. Bigelow	382
THE BIRDS OF CUSTER AND DAWSON COUNTIES, MONTANA. By E. S. Cameron. (Plates XV and XVI)	389
SUMMER BIRDS OF SOUTHWESTERN SASKATCHEWAN. By A. C. Bent. (Plates XVII-XX.)	407
FURTHER NOTES FROM EXTREME SOUTHERN ILLINOIS. By John P. Ferry	430
GENERAL NOTES.—The Kittiwake and Purple Sandpiper again in Maine in Summer, 435; That Cinnamon Teal Record from Florida, 435; The Snowy Heron in Camden County, N. J., 436; American Coot ( <i>Fulica americana</i> ) Nesting near Newark, N. J., 436; The Stilt Sandpiper in Massachusetts, 437; The Buff-breasted Sandpiper ( <i>Tringites subruficollis</i> ) on Long Island, N. Y., 437; American Goshawk ( <i>Accipiter atricapillus</i> ) versus Man and Barred Owl, 437; Unusual Occurrence of the Short-eared Owl in Pennsylvania, 438; The Breeding of the Short-eared Owl ( <i>Asio accipitrinus</i> ) near Ann Arbor, Michigan, 439; Mortality among Kingfishers, 439; The American Crossbill in Camden County, Ga., 439; Nesting of Crossbills in Colorado, 440; Occurrence of a White-winged Crossbill at Oxen Hill, Md., in August, 442; The Vesper Sparrow ( <i>Pooecetes gramineus</i> ) on Long Island, N. Y., 442; A White-throated Sparrow in Washington, D. C., in August, 442; Nesting of the Rose-breasted Grosbeak in Philadelphia County, Pa., 442; An Intergrade between <i>Helminthophila pinus</i> and <i>H. leucobronchialis</i> captured in Hyde Park, Mass., 443; Additional Notes on the Brewster's Warbler in the Arnold Arboretum, Jamaica Plain, Mass., 444; <i>Helminthophila leucobronchialis</i> (Brewst.) in Lexington, Mass., 444; A Correction, 446; The Northern Water-Thrush again Nesting in Massachusetts, 446; A Mockingbird ( <i>Mimus polyglottos</i> ) in Lexington, Mass., in Winter and Summer, 446; The Great Carolina Wren in Southern Rhode Island, 446; Large Set of Brown-headed Nuthatch's Eggs, 447; A Recent Blue-gray Gnatcatcher ( <i>Polioploca carulea</i> ) in Delaware Co., Pa., 447; Two Birds New for Ohio ( <i>Oceanites oceanicus</i> and <i>Merula migratoria achruslera</i> ), 447; Pettiver's 'Gazophylacium,' 448; Supplemental Note to 'A Lapland Longspur Tragedy,' 449.	430
RECENT LITERATURE.—Ridgway's 'The Birds' of North and Middle America,' Part IV, 450; Townsend and Allen's 'Birds of Labrador,' 451; Townsend's 'Along the Labrador Coast,' 452; Clark on New Birds from Eastern Asia and the Aleutian Islands, 453; Blackwelder's Notes on Chinese Zoölogy, 453; Bangs on Birds from Costa Rica and Chiriquí, 453; Clarke 'On the Birds of the Weddell and adjacent Seas, 454; Goeldi's 'Album de Aves Amazonicas,' 455; Mrs. Davenport's 'Birds of Windham and Bennington Counties, Vermont,' 456; Herman's 'The Protection of Birds in Hungary, 456; Williams's 'Game Commissions and Wardens,' 457; Anderson's 'The Birds of Iowa,' 458; Rich's 'Feathered Game of the Northeast,' 459.	450
CORRESPONDENCE.—Protective Coloration, 460.	
NOTES AND NEWS.—Obituary, Dr. William La Grange Ralph, 461. The Seventh International Zoölogical Congress, 462; Twenty-fifth Congress of the American Ornithologists' Union, 466.	
INDEX . . . . .	467
ERRATA . . . . .	492
CONTENTS OF VOLUME . . . . .	iii
OFFICERS AND MEMBERS . . . . .	ix

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(Continued on 3rd page of Cover.)

